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Benzodiazepine Use Among Recently Institutionalized Older Adults

BY

DIANNE L. HENDERSON

A Thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements for the degree of MASTER OF NURSING

Faculty of Nursing

Edmonton, Alberta

Spring, 1996

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Dr. Marilynn J. Wood, Co-Supervisor

Professor Ann Marie Pagliaro, Co-Supervisor

Dr. Janet McElhaney

April 12, 1996

Date

Dedication

Dedicated to all of the older adults who, through their courage and determination, have maintained their independence despite great adversity; and especially to those who have not always received the opportunity to achieve higher levels of health and independent living.

Abstract

The problematic use of benzodiazepines among older adults has been widely noted in the clinical and scientific literature. The purposes of this retrospective study were to identify: 1.) the prevalence of benzodiazepine use among a sample of older adults at the time of admission to a long-term care facility and at specified time intervals of thirty and sixty days after admission; 2.) if recommended guidelines for benzodiazepine use were being followed; 3.) the characteristics of the older adults; and 4.) the relationships between #1 and #3. The collected data from 141 charts of subjects that met the inclusion criteria were coded and descriptive and chi-square statistics were completed. The results and implications of this study are presented and discussed in relation to the findings from other related studies.

Acknowledgments

Surprisingly, as I reflect on my academic career, it has occurred to me that the achievement of completing this degree has been like trying to conquer the art and science of riding my first pony, Feisty (a name she would live up to time and time again). As a young girl, imagining scenes from "Black Beauty", it was a bit of a shock to find that I was spending more time on the ground than riding. Despite the many bruises and scrapes that I received after being "prematurely dismounted", I was determined to ride Feisty so that "the wind blew through my hair". It took a few years, many different approaches, and several pairs of jeans; but finally, despite the bruises, the pain, and disappointments, I managed to achieve my goal.

Unfortunately, although I arrived eagerly and, perhaps, rather naively, to complete this degree, it was a bit of a shock to discover that not all of the members of our profession were willing to assist me in achieving this goal. Like learning to ride Feisty, it seemed, at times, that I spent more time trying to "figure out the system", than actually developing a deeper understanding and knowledge of nursing. However, despite the bruises, pains, and disappointments I have managed to achieve the goals that I set out for myself.

In acknowledging the people that helped me to achieve these goals I must first acknowledge my biggest supporter - my mother, Joyce Henderson. Although she often wonders if I will ever finish studying, she continues to provide me with the love and support that she offered when I first began my journey (and more often than not was the one that helped me up and held Feisty while I "got back on"). How was she to recognize that the kid who talked too loud, sometimes out of turn, and who stubbornly argued that the

car that just passed the house was ***not*** black, but black ***with a white stripe***, would reach this level of achievement?

Secondly, although I wish to thank all of the members of my thesis committee for their contributions in advising me though the planning and completion of my thesis, I would especially like to thank Professor Ann Marie Pagliaro and her husband, Dr. Louis A. Pagliaro (a "silent" external committee member) for their continuous encouragement and support of my educational endeavors. In addition to their expertise and knowledge, they are exemplary scholars and researchers. Always in pursuit of their own best work, they have challenged me to strive for higher levels of achievement and a better understanding of the world that surrounds us. Unlike some students who only get the opportunity to view the world from one perspective, I have been challenged to look beyond this limited vision and to explore alternative explanations for what appears to be the truth.

I would also like to pay tribute to all of my colleagues who provided me with support and encouragement to complete this thesis. Although there are many, I would like to personally acknowledge my dear friend Karen Ingle, who is perhaps my most honest and respected critic. I would also like to thank those colleagues whom I have worked with and who have always provided encouragement: Shirley Shongrunder, who is one of the finest nurses that I have known; Pat Ward, my "twin" for whom I have the utmost respect and admiration, both as a nurse and as a person; Paula Hunter and Barb Lindsay for allowing me every opportunity to pursue my education; Corrine Truman, whom I have shared both achievements and frustrations as we attempt to master the science of research; and Cheryl Knight, for her endless support, ideas, and encouragement. In addition, I would like to

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I would also like to take this opportunity to acknowledge and thank two others whom I have encountered along this journey and who have provided me an opportunity to expand and enrich my life in a very different direction: Paul Briske and Bear. Not only has Paul provided me with endless hours of computer and technical support, but both he and Bear gently (and sometimes not so gently) remind me that there is an external environment outside of the University that continues to exist. One that is totally uncontrollable, unpredictable, spontaneous, and equally rewarding.

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List of Abbreviations and Symbols

⌀	no change	e.g.	for example
+	added	H	hour
-	discontinued	HS	at bedtime
>	greater than	i.e.	that is
≥	greater than, or equal to	mg	milligram
<	less than	n	number
≤	less than, or equal to	N/A	not available
©	copyright	p	probability
®	registered	PRN	"pro re nata" - as required
%	percentage	*Q*	Cochrane's Quotient
χ^2	Chi-square	Q	every
AAPI	Alberta Assessment and Placement Instrument	QHS	every night
BID	twice per day	QID	four times per day
C	Cochrane's Contingency Coefficient	t	t-test for population mean, variance unknown
CHF	congestive heart failure	TID	three times per day
CVA	cardiovascular accident	SSPS-PC	Statistical Package for the Social Sciences Release 6
df	degrees of freedom	STAT	now
DSM-IV	Diagnostic and Statistical Manual of Mental Disorders (4th edition)		

Chapter 1

Introduction

Benzodiazepines (Table 1.1) may reduce the ability of older adults to maintain their health and independent living (e.g., perform self-care activities) as a direct, central pharmacological effect. Although the use of benzodiazepines can be helpful in the short-term management of anxiety or insomnia among older adults, their use has been associated with accidental injuries (e.g., falls), addiction, reduced cognitive and psychomotor functioning, and rebound insomnia and anxiety (Barbee, 1993; Barzagan & Barber, 1992; Bixler, Kales, Burbaker, & Kales, 1987; Closser, 1991; Cole & Kando, 1993; Hogan & McElhaney, 1994; Kane & Lieberman, 1992; Miller & Gold, 1991; Potts & Krishman, 1992; Ryynanen, Kivela, Honkanen, Laippala, & Saano, 1993). Despite published guidelines (e.g., Beers et al., 1991; Hogan & McElhaney; Krogh, 1995; Maletta, Mattox, & Dysken, 1991; Mental Health Foundation, 1991) that clearly indicate that benzodiazepines should be used cautiously among older adults and only for short periods of time (i.e., less than one month) (Beers et al., 1991; Krogh, 1995; Hogan & McElhaney, 1994; Mental Health Foundation, 1991; Pagliaro & Pagliaro, 1992), they are commonly used inappropriately (Abrams & Alexopoulous, 1987; Arling, Ryther, Collins, & Zimmerman, 1990; Fritz & Stewart, 1990; Gilbert, Quittrel, & Owen, 1988; Glanz & Backenheimer, 1988; Heston et al., 1992; Kane & Lieberman, 1994; Lyndon & Russell, 1990; Pagliaro & Pagliaro, 1992; Puryear, Lovitt, & Miller, 1991; Svarstad & Mount, 1991).

Older adults are generally more sensitive to benzodiazepines due to the physiological changes associated with normal human aging which may place them at greater risk than younger adults for injury (Lamy, 1988; Ray, Thappa & Shorr, 1993). The direct central effects of the benzodiazepines also may reduce the ability of older adults to reside in their own homes without home care or other assistance. The inability of older adults to meet their daily needs may result in a change in residence such as a move to a long term care facility (also termed nursing home or auxiliary hospital; please see appendix A for definitions of terms used in this thesis). In addition to the increased social costs associated with care in long term care facilities, this change in residence is often a negative experience for older adults who define their health based on their abilities to remain independent in their own homes or apartments (Northcott, 1992; Seniors Advisory Council for Alberta, 1992).

Self-Care Deficit Theory and Benzodiazepine Use among Older Adults

Using Orem's self-care deficit theory (Orem, 1995), it can be postulated that the use of benzodiazepines can effect the self-care agency of the older adult. That is, the pharmacologic effects of benzodiazepines have the potential to affect self-care agency, resulting in a change in self-care abilities. Such a change can affect the type of nursing service needed (i.e., nursing system; see also figure 1.1). For example, the use of benzodiazepines can reduce the anxiety among some older adults (e.g., those with anxiety disorders amenable to treatment with an anxiolytic drug) and, thus, may increase their self-care agency (e.g., cognitive abilities) and enable them to better meet their self-care needs. These older adults generally would require supportive-educative

or no nursing services. For other older adults, the sedative hypnotic effects and adverse drug reactions associated with the benzodiazepines (e.g., increased reaction time, decreased coordination) may decrease their self-care agencies (i.e., cognitive function, psychomotor skills) and, thus, their abilities to meet their self-care needs. These older adults may require partially compensatory or wholly compensatory nursing care as a direct effect of the use of the benzodiazepines. It also seems plausible that the discontinuation of benzodiazepine use among some older adults may be associated with a change in their self-care agencies (e.g., return or loss of their cognitive and psychomotor functioning) and, thus, their abilities to meet their self-care needs. Although more research is needed to determine such relationships, in one long term care facility, the successful discontinuation of benzodiazepines among older adults resulted in an increase in memory and cognitive function with no increase in anxiety, agitation or sleeplessness (Salzman et al., 1992).

The pharmacological effects of the benzodiazepines can and do affect the ability of older adults to complete self-care activities, therefore, it is critical for nurses who are involved in the promotion of self-care activities among older adults, to recognize how the effects of such pharmacotherapy can contribute to changes in self-care agency. In addition, if, as the literature suggests, benzodiazepines are inappropriately prescribed for older adults, it seems prudent that nurses, as self-care agents and professionals, advocate for optimal pharmacotherapy and promote, wherever possible, self-care agency among their clients.

Purpose of this Study

The use of benzodiazepines among older adults is common despite the literature that suggests that the central effects of the benzodiazepines can have negative outcomes for older adults (e.g., reduced ability to perform self-care, including, increased potential for injury) (Arling et al., 1990; Gilbert et al., 1988; Garrard et al., 1992; Geisselmann & Linden, 1991; Laurier et al., 1992; Puryear et al., 1991; Robertson & Gray, 1991; Svarstad & Mount, 1991). Guidelines (Beers et al., 1991; Hogan & McElhaney, 1994; Krogh, 1995, Maletta et al., 1991; McEvoy, 1995, Mental Health Foundation, 1991) have been established which clearly indicate that for older adults, the smallest effective dose of short acting benzodiazepines should be used for a short length of time (less than 30 days). Therefore, it would be expected that older adults who required and used benzodiazepines prior to and on admission to a long term care facility would have the benzodiazepine discontinued through a gradual tapering method over the first month of residence. Conversely, those older adults who required a benzodiazepine upon or shortly after admission for the treatment of short term anxiety or insomnia, perhaps related to their change in residence, would, in accordance with established guidelines, have the need for the drug reviewed and discontinued after 30 days of use.

The purpose of this research study is to answer the following primary question: What is the prevalence of benzodiazepine use among older adults admitted to a long term care facility in the Edmonton area? More specifically, for older adults admitted to a long term care facility in the Edmonton area (see Figure 1.2):

i.) what is the prevalence of benzodiazepine use at admission (0 days)?

ii.) are guidelines for benzodiazepine use being followed?

Secondary questions that will be answered include:

1.) what are the characteristics of older adults admitted to a long term care facility in the Edmonton area?

2.) are there any significant relationships between the characteristics of the older adults and the patterns of benzodiazepine use identified at 0, 30 and 60 days after admission?

Table 1.1

Benzodiazepines Commonly Prescribed for Older Adults

Generic Name	Trade Name	Half-Life[1]	Major Active Metabolites (half-life)
Alprazolam	Xanax®	9-27	•none
Chlordiazepoxide	Librium®	12-24.4	•demoxepam (14-95) •desmethychlordiazepoxide (14-95) •desmethyldiazepam (29-223) •oxazepam (6-25)
Diazepam	Valium®	90	•desmethyldiazepam (29-223) •3-hydroxydiazepam (5-20) •oxazepam (6-25)
Flurazepam	Dalmane®	N/A	•desalkylflurazepam (40-103) •N-1-hydroxyethyflurazepam (0.8-1.0)
Lorazepam	Ativan®	9-24	•none
Oxazepam	Serax®	6-25	•none
Temazepam	Restoril®	11.9-17.2	•none
Triazolam	Halcion®	4	•none

[1] As has been identified in adults 65 years of age or older (Maletta, Mattox, & Dysken, 1991).

Figure 1.1. Hypothesized relationships among the pharmacologic effects of benzodiazepines on self-care agency (e.g., cognitive ability, psychomotor skills) and nursing systems (e.g., nursing care required). That is, the increased pharmacologic effects of benzodiazepines may cause a decrease or an increase in the function of self-care agency, resulting in a need for different types of nursing care.

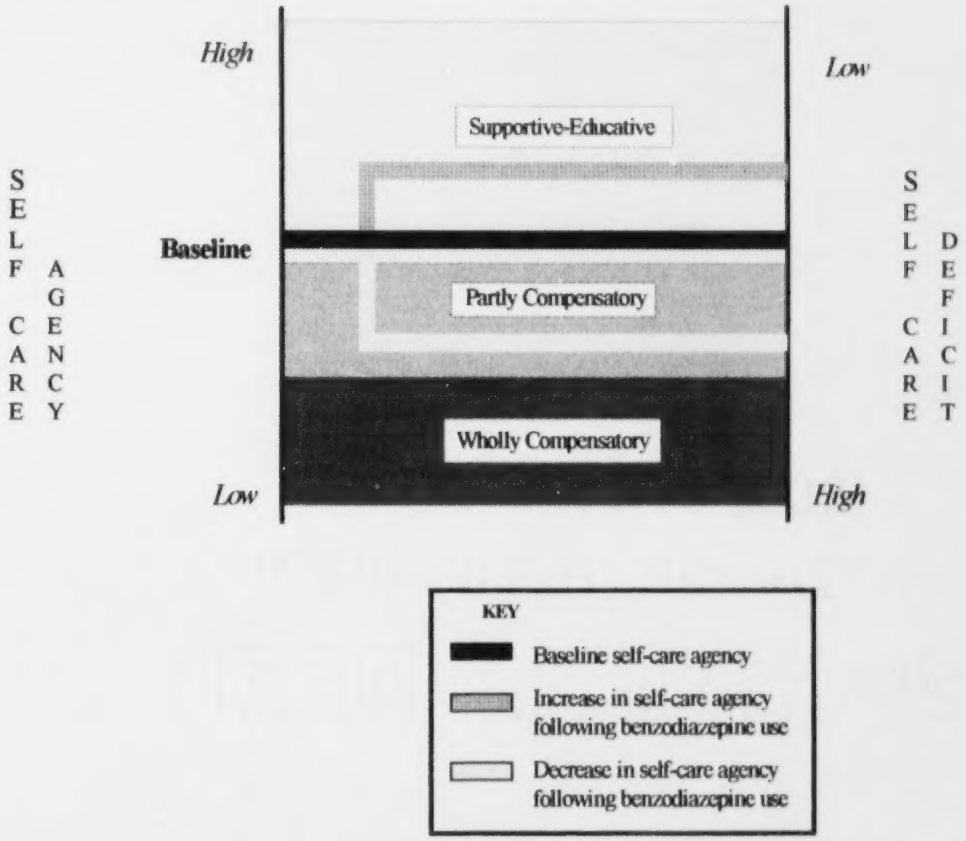

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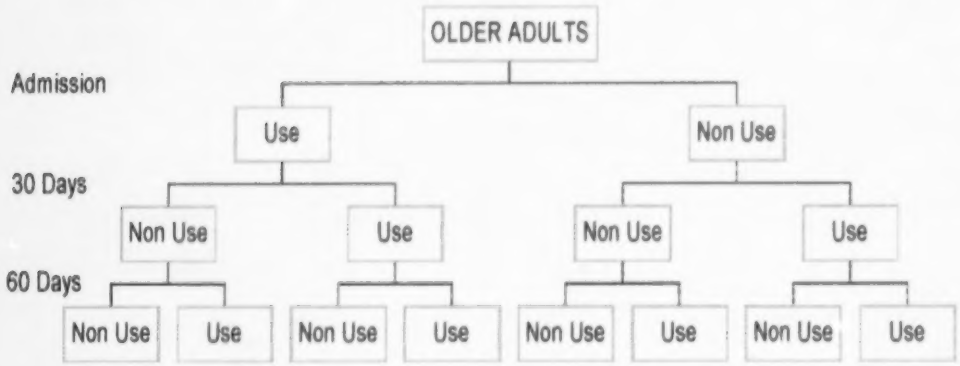
Figure 1.2. The possible patterns of benzodiazepine use among older adults at admission, and at 30 days and 60 days after admission.



Chapter 2

Benzodiazepine Use Among Older Adults: A Review of the Published Literature

Benzodiazepines are the most widely prescribed sedative-hypnotics for the reduction of anxiety and the promotion of sedation among the older adult population (Closser, 1991; Hogan & McElhaney, 1994; Nakra, Grossberg & Peck, 1991). They also are used as anticonvulsants and skeletal muscle relaxants (McEvoy, 1995). According to the Mental Health Foundation, benzodiazepines should not be used to treat bereavement, depression, mild anxiety or chronic insomnia among older adults and should only be used after all other nonpharmacologic alternatives have been tried (Mental Health Foundation, 1991). Benzodiazepines should be used judiciously among older adults who are generally more sensitive to their therapeutic effects and adverse drug reactions because of the physiological changes that occur with normal human aging which affect the pharmacodynamic and pharmacokinetic parameters of this class of drugs (Closser, 1991; Lamy, 1988; Lawlor & Sunderland, 1991; Miller & Gold, 1991; Pagliaro & Pagliaro, 1992; Roth & Roehrs, 1991; Viani, Rizzo, Carrai, & Pacifici, 1992). If benzodiazepines are indicated, the lowest effective dose of a short-acting benzodiazepine (e.g., oxazepam [Serax®]; see also Table 1.1) should be prescribed for a period of "about two weeks, but no longer than four weeks" (Mental Health Foundation, 1991, p. 1707).

Pharmacodynamics

All of the benzodiazepines have the same general mechanism of action and produce similar effects, although they do differ in their intensity of action and duration of effect (McEvoy, 1995; Miller & Gold, 1991). The sedative-hypnotic effects of the benzodiazepines are mediated through the *y*-aminobutyric acid (GABA) inhibitory receptor complex in the limbic area of the central nervous system (McEvoy, 1995). The GABA receptor complex surrounds a chloride ion channel which, when bound, causes a chlorine influx that hyperpolarizes the neuronal membrane, making it more difficult for excitatory neurotransmitters to depolarize the cell. Benzodiazepines enhance the actions of GABA, but fail to open the chloride channels in the absence of GABA (Olson, 1994).

Two specific benzodiazepine receptor sites have been identified: BZ_1 and BZ_2 (Drug Facts and Comparisons, 1995; McEvoy, 1995). It is postulated that the BZ_1 receptors are associated with sleep mechanisms, whereas, BZ_2 receptors are associated with memory, motor, sensory and cognitive functions (Drug Facts and Comparisons, 1995; McEvoy, 1995). Therefore, the normal cognitive changes associated with aging that reduce short-term memory and coordination and increase reaction time can be aggravated by the sedative-hypnotic properties of the benzodiazepines (Lamy, 1988; Ray Thapa, & Shorr 1993). In addition, it has been suggested that the benzodiazepine receptor sites may become more sensitive with normal human aging resulting in therapeutic effects and adverse drug reactions at lower dosages than those prescribed for younger adults (Ray et al., 1993).

Pharmacokinetics

Physiologically, the older adult has a decreased ability to absorb, metabolize, distribute and excrete benzodiazepines (Kane & Lieberman, 1992; Lamy, 1988; Monane, 1992). Major physiological changes that affect the pharmacokinetics of benzodiazepines include decreased plasma proteins; reduced renal, hepatic and cardiovascular function and efficiency; an increase in fat to lean body mass ratio; and reduced cognitive function (Lamy, 1988; Maletta, Mattox, & Dysken, 1991; Viani et al., 1992). Benzodiazepines are highly protein bound; therefore, the normal reduction of serum albumin in older adults results in an increased amount of unbound drug that can potentially cause toxicity at recommended usual adult dosages (Drug Facts and Comparisons, 1995; Kane & Lieberman, 1991; Maletta et al., 1991; McEvoy, 1995; Viani et al., 1992). In addition, because the benzodiazepines are primarily metabolized in the liver and excreted by the kidneys, the decline in hepatic and renal function normally associated with aging can result the extended half-lives of these drugs (Drug Facts and Comparisons, 1995; Maletta et al., 1991). The increased fat to lean body mass ratio common among older adults provides a storage area for the unmetabolized benzodiazepines and can contribute to benzodiazepine toxicity (Kane & Lieberman, 1991; Lamy, 1988; Maletta et al., 1991).

The physiological changes that occur normally with age that cause a decreased ability to absorb, metabolize, distribute and excrete benzodiazepines may be further complicated by the increase in drugs used to manage coexisting diseases and chronic illnesses (Lamy, 1988; Lawlor & Sunderland, 1991). In addition, the older adult may also be concomitantly ingesting drugs that inhibit the metabolism of benzodiazepines

and their metabolites, such as antibiotics (e.g., erythromycin), and histamine-2 antagonists (e.g., cimetidine) (Drug Facts and Comparisons, 1995; Kane & Lieberman, 1991). Overall, the noted physiological changes that affect the pharmacokinetics of benzodiazepines may predispose the older adult to experiencing more adverse drug reactions at lower dosages over shorter treatment periods.

The Adverse Drug Reactions of Benzodiazepines among Older Adults

Although the benzodiazepines can be of positive therapeutic benefit to older adults in the short term management of anxiety and insomnia (less than 4 weeks) and have been successfully used as preoperative and intraoperative sedation, as discussed earlier, they also can have negative affects on cognitive functioning, learning and memory, motivation, and psychomotor skill performance (Barbee, 1993; Barzagan & Barber, 1992; Bixler et al., 1987; Closser, 1991; Cole & Kando, 1993; Hogan & McElhaney, 1994; Krogh, 1995; Roth & Roehrs, 1991; Kane & Lieberman, 1992; Miller & Gold, 1991; Potts & Krishman, 1992; Roth & Roehrs, 1991; Ryyanen et al., 1993). These effects may result in the reduced self-care agency or ability of older adults to maintain their health and independent living (i.e., bathing, food preparation, grooming, medication management, self-protection from injury).

The older adult, who may be experiencing the effects of normal aging on self-care agency including, changes in attention, the speed of cognitive processing, reaction time, the memory for newly learned information, and psychomotor functioning, is more likely to demonstrate such impairment when using benzodiazepines (Barbee, 1993; Bazargan & Barber, 1992; Deijen, Heemstra, & Orlebeke, 1991; Hart Colenda

& Hamer, 1991; Lamy, 1988; Ray et al., 1993; Rummano, Davis, Morse, & Invik, 1993; Woods & Winger, 1995; Salzman et al., 1992). Such cognitive and other impairment associated with the use of benzodiazepines also has been linked to an increase in falls, hip fractures, minor injuries and motor vehicle crashes (Aisen, Deluca, & Lawlor, 1992; Angus & Turbayne, 1995; Cumming & Kineberg, 1993; Hogan & McElhaney, 1994; MacDonald, 1985; Ray, Griffin, & Downey, 1989; Ray et al., 1993; Ryynanen, et al., 1993; Sorock & Labiner, 1992; Trewin, Lawrence, & Veitch., 1992). Due to these potential effects on self-care agency, it has been suggested that benzodiazepines should be discontinued at the first sign of cognitive impairment (Potts & Krishman, 1992). Other potential adverse effects of benzodiazepines include: addiction, agitation, anxiety, ataxia, blurred or double vision, confusion, disorientation, drowsiness, emotional blunting, impaired coordination, light headedness, and memory impairment (Arai & Fujii, 1990; Barbee, 1993; Bixler, Kales, Brubaker, & Kales, 1987; Closser, 1991; Cohen & Lawton, 1992; Cole & Kando, 1993; Gillin, 1991; Hogan & McElhaney, 1994; McEvoy, 1995; Pagliaro & Pagliaro, 1992; Playford, 1991; Ray et al., 1993; Rummans et al., 1993; Roth & Roehrs, 1991; Salzman et al., 1991; Vogel, 1992).

Case reports also have noted that the use of benzodiazepines among older adults can cause: aggravation of pre-existing confusional states in the agitated, demented, or alcoholic patient (Burch, 1990; O'Reilly & Smith, 1991; Yudofsky, Silver, & Hales, 1990); hallucinations (Fishman, 1992; Sasa, Otani, Kondo, Kaneko, & Fukushima, 1990); catatonia (Harris & Menza, 1989); and paranoia (Schogt & Conn,

1983). Cole and Kando (1993) reviewed the published case reports of adverse drug reactions and classified the behavioral changes associated with the use of benzodiazepines into one of seven categories: 1.) anger or violence; 2.) suicidal or self-harming behavior; 3.) depression; 4.) mania; 5.) schizophrenia; 6.) withdrawal syndromes; and 7.) physical dependence and abuse liability. These adverse drug reactions also are potentiated when benzodiazepines are used in combination with other sedative-hypnotics, such as alcohol (Barbee, 1993; Hughes & McElhaney, 1994; Pagliaro & Pagliaro, 1992). In addition, it has been noted that benzodiazepines have been substituted for alcohol by some people with histories of alcoholism because they produce similar pharmacodynamic effects (Potts & Krishnan, 1992; Sellers et al., 1993).

Prevalence of Benzodiazepine Use among Older Adults

The prevalence of benzodiazepine use among older adults as reported in the scientific literature is variable. Different prevalence rates have been reported for different samples of older adults. For example, the prevalence of benzodiazepine use among older adults living in their own homes or apartments ranges from 5.1% (Laurier, Dumas & Gregoire, 1992) to 30.8% (Angus & Turbayne, 1995). Reported prevalence rates of benzodiazepine use among long term care residents ranges from 13% to 34% (Arling et al., 1990; Beers, Dang, Hasegawa, & Tamai, 1989; Garrard et al., 1992; Robertson & Gray, 1991; Zullich, Grasela, Fiedler-Kelly & Gengo, 1992) with Svarstad and Mount (1991) concluding that 19% of long term care residents experienced excessive benzodiazepine use. Table 2.1 provides the prevalence rates

identified in the current literature. Ray et al., (1993) indicated that fewer than 5% of the benzodiazepines prescribed are for recommended indications, and that over 85% of the prescriptions are for more than 30 days despite guidelines that recommend that the smallest, effective dose of short-acting benzodiazepines should be prescribed for a period of no longer than four weeks (Beers et al., 1991; Krogh, 1995, McEvoy, 1995; Mental Health Foundation, 1991). Fortunately, recent studies indicate that the average benzodiazepine dosage has been reduced from previous years and there is an increase in the use of short acting versus long acting benzodiazepines (Garrard et al., 1992; Malcolm, 1992; Radecki & Brunton, 1993; Shorr, Bauwens, & Landefeld, 1994). Unfortunately, these same studies, and others, also indicate that the length of benzodiazepine use is usually longer than the recommended thirty days and can be as long as 20 years (Garrard et al., 1992; Isacson, Carsjo, Bergman & Blackburn, 1992; Shorr, Bauwens, & Landefeld, 1994; Simpson, Power, Wallace, Butcher, Swanson, & Simpson, 1990).

It has also been suggested that benzodiazepines are used inappropriately among long term care residents to control their agitation, aggressiveness, and dementia despite the lack of research to support these indications for use (Abrams & Alexopoulous, 1987; Ancill, Carlyle, Liang, & Holliday, 1991; Fritz & Stewart, 1990; Glanz & Backenheimer, 1988; Kane & Lieberman, 1994; Pagliaro & Pagliaro, 1992; Stern, Duffelmeyer, Zemishlani & Davidson, 1991). Other studies have noted that many depressed older adults are often inappropriately treated with benzodiazepines due to the lack of accurate diagnosis or an individualized treatment plan (Abrams &

Alexopoulous, 1987; Heston, Garrard, Makris, Kane & Cooper, 1992; Kane & Lieberman, 1994; Lyndon & Russell, 1990; Puryear et al., 1991; Svarstad & Mount, 1991). For example, Heston et al., (1992) found that the use of benzodiazepines to treat depression was more common than was the use of antidepressants.

Characteristics of Older Adults who use Benzodiazepines

Several studies have attempted to determine the relationship between various characteristics of older adults and their use of benzodiazepines (see Table 2.2). These studies indicate that the older adult who uses benzodiazepines is more frequently female (Glanz & Backenheimer, 1988; Isacson, Bingefors, Winnberg, & Dahlstrom, 1993; Mant, Mattic, deBurgh, Donnelly & Hall, 1995; Morgan, Gilleard, & Reive, 1982; North, McAvoy & Powell, 1992; Perodeau, King & Ostoj, 1992; Smart & Adalf, 1988; Swartz et al., 1991; Trewin et al., 1992; van der Waals, Mohrs, & Foets, 1993); separated or divorced (Swartz et al., 1991); white (Swartz et al., 1991); has a lower education level (Swartz et al., 1991); and is in the younger age range of older adults (i.e., 65-74 years of age) (Garrard et al., 1992; Hendricks, Johnson, Sheahan, & Coons, 1991; Perodeau et al., 1992; Shorr & Bauwens, 1990; Swartz et al., 1991). A decade ago, Gilleard, Smits and Morgan (1984) noted that people who were more mobile and less confused were more likely to be prescribed benzodiazepines. However, more recent studies have indicated that the use of benzodiazepines is related to increased chronic illnesses and reduced physical ability (Arling et al., 1991; Hendricks et al., 1991; Heston et al., 1992; Laurier et al., 1992; North et al., 1992;

Simpson et al., 1990; Sorock & Labiner, 1992) unstable medical conditions (Heston et al., 1992) and mental illness (Laurier et al., 1992; Svarstad & Mount, 1991).

Sources of Benzodiazepine Use among Older Adults

The major source of benzodiazepine use among older adults can be traced to the prescribing practices of physicians. Many older adults begin using benzodiazepines following an acute condition, hospitalization, or a life crisis (Beers et al., 1989; Lyndon & Russell, 1990; Surendrakuman et al., 1992). For example, older adults commonly experience multiple losses, including the death of spouses or friends, changes in living environments, decreased physical functioning and mobility, reduced income and socioeconomic status, and role changes (e.g., retirement) that can lead to anxiety, restlessness, and insomnia (D'Archangelo, 1993; Drake, McLaughlin, Pepper & Minkoff, 1991; Holmstrom, 1990).

Often, without determining the underlying reasons for the anxiety, restlessness, and insomnia, the older adult's physician may simply resort to prescribing a benzodiazepine. Physicians who prescribe benzodiazepines often believe that prescribing a benzodiazepine is the best method to treat anxiety and insomnia (Mant et al., 1995; Miller & Gold, 1991). In fact, Gilbert, Quinttrell & Owen (1988) found that over 80% of long term care residents were prescribed benzodiazepines for anxiety or insomnia. However, the use of benzodiazepines may not make a significant difference in sleep length or quality (Monane, Glynn & Avorn, 1996) and does not allow the older adult the opportunity to develop perhaps more satisfactory, nonpharmacological

solutions (Cormack & Howells, 1992; Closser, 1991; Miller, 1995; Miller & Gold, 1991; Monane, 1992).

Furthermore, it is often difficult to distinguish the adverse drug reactions associated with benzodiazepine use from an exacerbation of the symptoms of anxiety and insomnia that the benzodiazepines are most frequently prescribed to alleviate (Kane & Lieberman, 1992; Miller & Gold, 1991). Consequently, many older adults may have a benzodiazepine prescribed, but the drug is not discontinued following the resolution of the condition for which it was originally prescribed (e.g., temporary insomnia associated with moving into a long term care facility).

In addition, older adults may have benzodiazepines prescribed by physicians, based on habit rather than pharmacologic principles, to increase physician efficiency, reduce office visit time, or decrease the amount of required facility resources (e.g., the number of nursing staff in a long term care facility or hospital can be reduced if all of the residents are sedated) (Arling et al., 1991; Cormack & Howells, 1992; Farnsworth, 1990; Fritz & Stewart, 1990; Laurier et al., 1992; Pagliaro & Pagliaro, 1992; Puryear et al., 1991; Robertson & Gray, 1991; Rapoport, 1993; Shorr & Bauwens, 1990; Surendrakuman et al., 1992; Svarstad & Mount, 1991; Swartz et al., 1990; Tabisz, Jacyk, Fuchs, & Grymonpre, 1993; Thomson & Smith, 1995; Tully & Tallis, 1991).

Another contributing factor to the inappropriate prescribing of benzodiazepines may be the lack of education, information, and training regarding pharmacotherapy for older adults (Beers et al., 1993; Polypharmacy..., 1994; Rochon & Gurwitz, 1995; van der Waals et al., 1991). In fact, the implementation of an educational program

designed for nurses, nursing aids, and physicians has resulted in the reduced use of benzodiazepines among residents of one long term care facility in the United States (Avron, Soumerai, Everitt, Ross-Degnan & Beers, 1992). A reduction of benzodiazepine use among long term care residents was also noted in an Austrian facility following an education and relaxation program for residents, combined with an educational program for prescribers and caregivers (Gilbert, Owen, Innes & Sansom, 1993). Unfortunately, another study which examined the effect of different educational interventions on the prescribing practices of physicians in a prepaid group practice setting failed to demonstrate any change in the frequency or amount of benzodiazepines prescribed (Hartlaub, Barrett, Marine & Murphy, 1993).

It has been argued that the inappropriate prescription of the benzodiazepines is limited to a few prescribers who are described as being: 1.) "dated" physicians that are not current with knowledge developments (Farnsworth, 1990; Shorr & Bauwens, 1990); 2.) deceived physicians who receive false histories from their patients (Farnsworth, 1990; Glanz & Backenheimer, 1988; Sellers et al., 1993); 3.) "impaired" physicians who, themselves, use psychotropic drugs or have histories of psychiatric illness (Farnsworth, 1990); or 4.) physicians who prescribe psychotropics for profit (Farnsworth, 1990; Sellers et al., 1993). However in long term care facilities, a study by Beers et al. (1993) found that physicians who inappropriately prescribed psychotropics, including benzodiazepines, were most commonly: 1.) 52 years of age or older; 2) graduated from a United States or Canadian medical school before 1965;

3.) had small nursing home practices; and 4.) less frequently consulted with a psychiatrist.

Benzodiazepine use also can be related to the older adult who: 1.) actively seeks out this psychotropic by obtaining multiple prescriptions from multiple prescribers (Glanz & Backenheimer, 1988); or 2.) does not comply with prescribed instructions for use (Chenitz, Salisbury, & Stone, 1990). Older adults may have unrealistic expectations about the duration of their sleep patterns, which normally decreases with age; consequently they may actively seek out drugs to help them sleep longer (Hohagen, Kapper, Schram, Rink, & Weyerer, 1994). In addition, it is conceivable that some long term benzodiazepine users are taking this psychotropic to treat chronic or recurrent anxiety (Rickels, Case, Schweizer, Garcia-Espars & Friedman, 1991) or short term episodes of insomnia (Radecki & Brunton, 1993). However, the significant adverse drug reactions associated with benzodiazepine use that are clearly documented in the literature (e.g., cognitive impairment; potential for injury) require nurses and other health care professionals to question the use of benzodiazepines that exceed the guideline of 30 days and to take appropriate action to prevent their inappropriate use (North et al., 1992).

Table 2.1

Prevalence Rates of Benzodiazepine Use Among older Adults Reported in the Current Literature

Prevalence	Setting	Reference
5.1%	Own home or apartment	Laurier et al., 1992
10.7%	Own home or apartment	Puryear et al., 1991
16.0%	Own home or apartment	Morgan, Dallosso, Ebrahim, Arie, & Fentem, 1988
24.0%	Own home or apartment	Thomson & Smith, 1995
30.8%	Own home or apartment	Angus & Turbayne, 1995
66.0%	Psychiatric Outpatient	Geisselmann & Linden, 1991
8.6%[a]	Acute Hospital	Beers et al., 1989
10.2%[b]	Acute Hospital	Beers et al., 1989
21.0%[a]	Long Term Care Facility	Garrard et al., 1992
15.0%[c]	Long Term Care Facility	Garrard et al., 1992
26.0%	Long Term Care Facility	Arlington et al., 1990
34.0%	Long Term Care Facility	Morgan et al., 1982
33.9%	Long Term Care Facility	Robertson & Gray, 1991
20.5%[d]	Long Term Care Facility	Zullich et al., 1992
13.0%[e]	Long Term Care Facility	Zullich et al., 1992

[a]at admission
[b]discharge
[c]90 days after admission
[d]prior to implementation of a triple prescription program
[e]after implementation of a triple prescription program

Table 2.2

Characteristics of Older Adults who use Benzodiazepines

Characteristic	*Reference*
Age, 65-74 years	Garrard et al., 1992; Hendricks et al., 1991; Perodeau et al., 1992; Shorr & Bauwens, 1990; Swartz et al., 1991
Chronic Illness	Arling et al., 1991; Hendricks et al., 1991; Heston et al., 1992; Laurier et al., 1992; Sorock & Labiner, 1992
Female	Glanz & Backenheimer, 1988; Isacson et al., 1993; Mant et al., 1995; Morgan et al., 1982; North et al., 1992; Perodeau et al., 1992; Smart & Adalf, 1988; Swartz et al., 1991; van der Waals et al., 1993
Higher Mobility	Gilleard et al., 1984
Lower Educational Level	Swartz et al., 1991
Mental Illness	Laurier et al., 1992; Svarstad & Mount, 1991
Physical Illness or Complaints	Arling et al., 1991; Hendricks et al., 1991; Heston et al., 1992; Laurier et al., 1992; North et al., 1992; Sorock & Labiner, 1992
Separated or Divorced	Swartz et al., 1991
Unstable Medical Condition	Heston et al., 1992
Caucasian	Swartz et al., 1991

Chapter 3

Research Method

Design

A retrospective survey of the chart records of older adults who had been admitted to a long term care facility was completed in order to determine the nature and extent of benzodiazepine use at the time of admission and at 30 days and 60 days following admission. Demographic data were also collected regarding the characteristics of older adults identified as benzodiazepine users and nonusers at the time of admission and at 30 and 60 days after admission.

Sample

A nonprobability convenience sample was used for this study, which comprised the long term care chart records of all older adults (male and female), 55 years of age or older, who were admitted to a regional long term care facility in the Edmonton area within a 12 month period (January 1, 1994 to December 31, 1994). The long term care facility was chosen for the following reasons: 1.) the facility was comprised of several different sites in the Edmonton area; 2.) all admissions to the facility were made following a review by the Central Agency Placement Committee for the Edmonton area; 3) clinical specialists expressed an interest in the research project; and 4.) access to the data of interest was granted by facility management.

Criteria for inclusion in the study were: 1.) aged 55 years of age and older; 2.) admission to the long term care facility between January 1, 1994 and December 31, 1994; and 3.) maintenance of continuous residency for a minimum of 60 days. To

access the chart records that met the inclusion criteria a listing of all identification numbers and names of older adults admitted between the dates specified was obtained from the health records department of the long term care facility.

Ethical Considerations

Ethical clearance for this study was obtained from the Human Ethics Review Committee of the Faculty of Nursing at the University of Alberta. In addition, permission to access chart record data and appropriate ethical clearance for the study was obtained from the Chief Executive Officer of the selected facility from which the data were collected. A code was used for each case (chart record) so that confidentiality and anonymity were maintained. No names or other identifying information of the residents (e.g., personal health number; old age security number; room number) family members, physician(s), or other health care workers were recorded on the data collection instrument. The data collection was conducted within the facility chosen in a designated room either on the resident's unit or in the health records area to ensure confidentiality. Only information required to complete the data collection instrument was collected and recorded. There were no direct benefits to subjects whose chart records were accessed and there was no perceived risk to them.

Instruments

Benzodiazepine Use among Older Adults Admitted to Long Term Care Facilities Data Collection Instrument-Revised

The Benzodiazepine Use among Older Adults Admitted to Long Term Care Facilities Data Collection Instrument-Revised was used to record the demographic

characteristics of older adults admitted to the long term care facility and their use or nonuse of benzodiazepines upon admission and 30, and 60 days after admission. This tool was developed specifically for this study because there was no other instrument currently published that measured the prevalence of benzodiazepine use among older adults admitted to a long term care facility or the characteristics of these older adults. The instrument was developed taking into consideration the information provided in the current literature regarding the prevalence of benzodiazepine use among older adults and the reported characteristics of benzodiazepine users and nonusers. Following initial development, this instrument (Appendix B) was reviewed by 5 experts in the area of gerontology and pharmacopsychology to ensure content validity. The tool was piloted on twelve chart records to assess its usefulness in collecting the data of interest. Following the pilot, the data collection tool was modified in order to increase efficiency of data collection (i.e., the ordering of the items) and to increase the accuracy of data collection and coding (e.g., data items were numbered consecutively; provision for yes/no identification was clearly made for dichotomous variables; see Appendix C).

Chart Records

Chart records were made available to the researcher in the health records department or on the nursing unit(s) of the long term care facility. Accuracy of chart records, including the prescribing and administration of drugs, are monitored through the quality management department of the selected long term care facility and are also evaluated on a regular basis during the accreditation process (which is repeated every

one to three years). Therefore, although the reliability and validity of information contained in the chart records was not formally measured, it was expected to be satisfactory.

Alberta Assessment and Placement Instrument (AAPI)

Prior to admission, all older adults who apply for admission to long term care facilities in Alberta undergoe an assessment process that includes the completion of the Alberta Assessment and Placement Instrument for Long Term Care (AAPI) prior to their admission. The AAPI, an instrument that provides a comprehensive evaluation and placement recommendation for every resident of the province that applies for long term care includes a drug, physical, psychological and social history (McKenzie, Capuzzi, & Will, 1989). The AAPI incorporates the physical, psychological, and social data obtained from applicants such as their abilities to maintain health and independent living (e.g., bathing, drug administration, mobility, transportation), the resources available to those in the community to assist them in meeting identified needs (e.g., family members, home care assistance), and if acute medical care or rehabilitation (e.g., hospitalization for drug detoxification, rehabilitation) is required.

The assessment information provides a "score" or "rating" indicating the level and amount of care required (A, B, C, D, E, F, G) by applicants. Generally, applicants who have been assessed at an A or B rating are maintained in the community with home care assistance or are recommended for lodge placement (i.e., assisted living with the provision of prepared meals and housekeeping). Those applicants who are assessed in the middle range ratings (C, D, E) require less nursing care and

supervision, but are considered to be unable to manage in a lodge or lodge-like setting environment (e.g., older adults who have been diagnosed with Alzheimer's disease and who may require cueing and monitoring in order to manage their health and independent living). Those older adults who are rated as being in the F or G categories require the most supervision and assistance with their health and independent living needs (e.g., a resident with chronic obstructive pulmonary disease [COPD] who requires oxygen and lacks sufficient energy to meet most of his or her personal care needs [bathing, grooming, mobility and transferring, toileting]).

Reliability and validity have been demonstrated for the AAPI (McKenzie et al., 1989). The AAPI is used to assess older adults only by those health care professionals (e.g., nurses, occupational therapists, social workers) who have been specially trained in the use of the instrument and the interpretation of results. Interrater reliability among trained health care professionals has been reported to be 77.2% ($k = 0.47$) (McKenzie et al., 1989). Concurrent validity also was established with 84% agreement between the AAPI placement recommendation and the placement recommended by the primary caregiver (McKenzie et al., 1989).

Procedure

This study consisted of two parts: a pilot study and a major study. Both parts consisted of a retrospective study of the chart records of all older adults admitted to a specified long term care facility in the greater Edmonton area between January 1, 1994 and December 31, 1994. The pilot study was conducted on approximately 10% ($n = 12$) of the accessed chart records for this study. The purpose of the pilot study was to

develop and evaluate the data collection instrument, to note problem areas in the use of the instrument, and to make necessary revisions to the instrument (i.e., is the data collection instrument useful for collecting the data of interest?) before the major study was undertaken. The pilot study also evaluated the procedures that were developed to access the chart records, record data, and to assure anonymity and confidentiality.

In both the pilot and the major studies, the data were collected from the retrospective study of chart records of residents in the following manner. The researcher noted the resident's age and verified with the health records department the residency status of each resident to assure that inclusion criteria were met (i.e., current resident, discharge date). The chart records of those residents who met the inclusion criteria were then obtained and the data which included the AAPI, the admission records, physician and nurses notes, and drug records, were collected on the data collection instrument.

Chart records for residents who were admitted between January 1 and December 31, 1994 were examined in a separate room to ensure confidentiality. Those chart records of residents who were discharged prior to the data collection date were examined in the health records area in a designated room to ensure confidentiality. At no time were chart records left unattended or were other people admitted to the room when chart records were being reviewed. Chart records of residents currently residing at the facility were examined on the nursing unit in a separate conference or meeting room as per data collection protocol. Each chart record was removed from the nursing unit and examined independently by the

researcher. If any of the relevant data (i.e., AAPI) had been removed from the chart record, then the researcher obtained these data, when available, from the unit storage cabinet, or the health records department. Data that were not available in the chart records were identified as 'not available' on the data collection instrument. For example, several chart records did not include data regarding the educational level of the resident or his or her assessed AAPI Category.

There were no differences in the pilot study and the major study and, because the data collection instrument required no major revisions, pilot data were included in the major study data analysis. To ensure that the data had been collected in a consistent manner data throughout the study, following the collection of all the data, data were again collected from the first 12 charts used in the study. These data collection instruments were then compared to the initial data collection instrument used for these charts. As no differences were noted between these two data collection instruments, it was concluded that the data were collected in a consistent manner throughout the study.

Data Analysis

Prior to data analysis, the 141 data sets collected in this study were coded and entered into a computerized data file that was compatible with the Statistical Package for the Social Sciences, version 6.0 (SPSS-PC), a computerized statistical analysis and data management system. This coding was completed by translating the information collected on each data collection instrument into numerical codes according to the code book (see Appendix D) which was developed to facilitate the accurate and

consistent entry of information into the data file, thereby, minimizing errors that may occur during data coding and entry. Data that were not available were given specific codes in order that this information could be identified during data analysis.

Verification of the data entered into the computerized data file was completed by reviewing the data entered and comparing it to the original data collection instrument. Frequency tables were also created to ensure that all data were accurately coded and entered into the computerized data file. Following the identification of incomplete data sets or possible errors the computerized data file was compared to the data collection instruments. All missing data were coded and entered into the computerized data file and any data coding errors were corrected. Frequency tables were again created to ensure that the computerized data file was accurate and complete.

Following initial descriptive analysis (e.g., frequency distribution; means), multi-response categories (e.g., Medical Diagnosis) were collapsed and coded under new, separate variable headings. For example, medical diagnoses were grouped under variable headings such as Cardiovascular Disorders; however, additional variables labeled as "Other Medical Diagnoses" were created when more than one diagnosis was indicated on the chart record of a particular case or if the diagnosis identified was not listed as a category. In addition, where possible, variables that had low frequencies ($n < 10$) that would limit further statistical analysis were collapsed into new variables. For example, "diabetes" and "hypothyroidism" were collapsed and recoded under the variable, "Endocrine Disorders". In addition, cases that had an endocrine disorder

noted under the "Other Medical Diagnoses" variable (e.g., pituitary adenoma) were then recoded under this variable.

In order to answer the questions posed in this study, several statistical tests were completed. Measures of central tendency (e.g., mean) and variability (e.g., range, standard deviation) were used to determine the prevalence of benzodiazepine use at admission among the older adults admitted to the long term care facility in this study and to determine if current guidelines for benzodiazepine use were being followed (i.e., the prevalence of benzodiazepine use at 30 and 60 days after admission; number of doses administered). In addition, frequency tables were constructed to determine the types and dosages of benzodiazepines prescribed. Characteristics of the older adults in this study were also identified through measures of central tendency (e.g., average age) and frequency tables that were constructed for categorical variables (e.g., educational level, gender, physical disability).

To ascertain if there were any significant relationships between the prevalence of benzodiazepine use at admission, and at 30, and 60 days after admission, Cochrane's Q was completed (Bryman & Cramer, 1992; Siegel, 1956). To observe any significant relationships between the prevalence of benzodiazepine use at the three time periods specified and the characteristics of the older adults, either Pearson's r correlation for interval data, or chi-square contingency coefficient for nominal data was utilized. Variables that were unable to be accurately analyzed using chi-square due to an expected frequency of less than one, or a minimum expected frequency of 5

in more than 20% of the cells were analyzed using Fisher's Exact Test (Bryman & Cramer, 1992; Siegel, 1956; Streiner, 1986).

Chapter 4

Results

A total of 141 chart records were reviewed and data analyzed with attention to answering the questions established for this study. Among older adults admitted to a long term care facility in the Edmonton area:

1.) what is the prevalence of benzodiazepine use at admission (0 days)?

2.) are guidelines for benzodiazepine use being followed?

3.) what are the characteristics of older adults admitted to a long term care facility in the Edmonton area?

4.) are there any significant relationships between the characteristics of the older adults and the patterns of benzodiazepine use identified at 0, 30 and 60 days after admission?

The analysis of the data collected to answer these questions are presented in the following tables and figures.

Prevalence of Benzodiazepine Use and Guidelines for Use

The prevalence of benzodiazepine use at admission, and 30 and 60 days after admission is summarized in Table 4.1, which provides some data to answer the first and second questions identified for this study.

Table 4.1

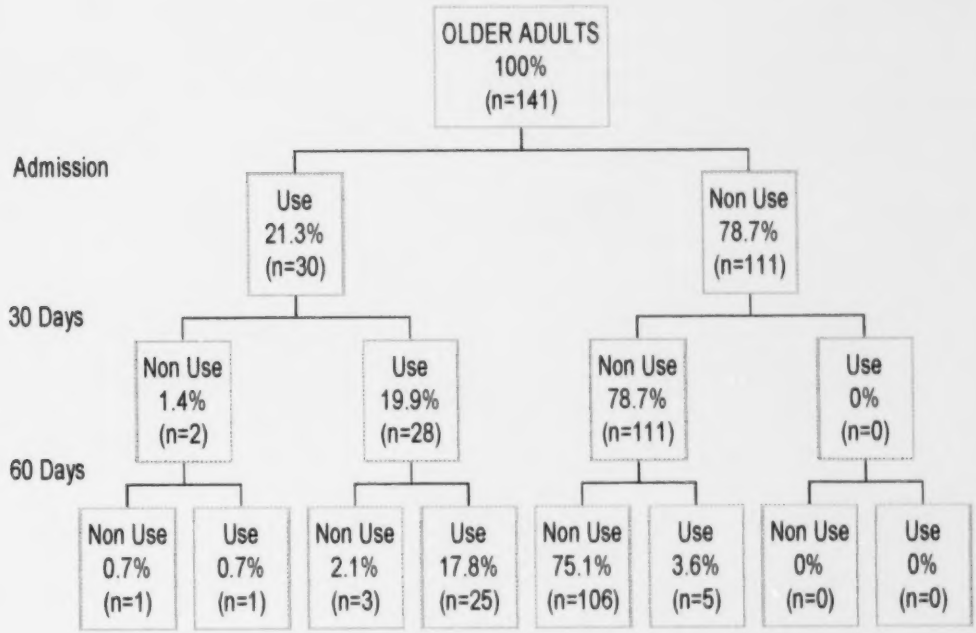
Prevalence of Benzodiazepine Use at Admission, and 30, and 60 days after admission

Benzodiazepine Prescribed	*Percentage (n)*[a]
0 Days	21.3% (30)
30 Days	19.9% (28)
60 Days	22.0% (31)

[a]includes second benzodiazepine prescribed, if applicable

17.8% (n = 25) of the residents admitted between January and December, 1994 were also prescribed a benzodiazepine at 30 and 60 days after admission. Two subjects (1.4%) had their prescriptions for a benzodiazepine discontinued within the first 30 days after admission, although one subject was again prescribed a benzodiazepine 60 days after admission. In addition, five subjects (3.6%) were first prescribed a benzodiazepine 60 days after admission (see Figure 4.1).

Figure 4.1. Benzodiazepine Use and Nonuse Patterns at Admission and 30, and 60 Days after Admission.



Of those prescribed a benzodiazepine, 16% (n = 5) were prescribed a second benzodiazepine at admission and 30 days after admission. Only one older adult had the second benzodiazepine discontinued at 60 days after admission. None of the older adults were prescribed more than two benzodiazepines.

Lorazepam was the most frequently prescribed benzodiazepine followed by oxazepam, alprazolam, temazepam, triazolam and flurazepam (Table 4.2, 4.3).

Table 4.2

Types of Benzodiazepines Prescribed at Admission, and 30 and 60 Days

	Admission	*30 Days*	*60 Days*
Lorazepam	67.6%	66.7%	69.4%
Oxazepam	11.7%	12.1%	11.1%
Alprazolam	5.8%	9.1%	13.8%
Temazepam	8.8%	9.1%	5.5%
Triazolam	2.9%	3.0%	0.0%
Flurazepam	2.9%	0.0%	0.0%

Table 4.3

Types of Benzodiazepines Continued (∅), Discontinued (-), or Added (+) at 30 and 60 days

Benzodiazepine	*30 Days*	*60 Days*
Alprazolam	+	+
Flurazepam	-	∅
Lorazepam	-[a]	+
Oxazepam	∅	∅
Temazepam	∅	-
Triazolam	∅	-

[a]includes the discontinuation of second type of benzodiazepine prescribed

The indicated reasons for the use of each type benzodiazepine prescribed in this study, as noted in the chart record, are presented in Table 4.4. In all cases in which two benzodiazepines were prescribed, one of the benzodiazepines were prescribed for insomnia.

Table 4.4

Indicated Reasons for Benzodiazepine Use at Admission, and 30, and 60 days after admission

	Admission	*30 Days*	*60 Days*
Alprazolam			
Agitation	1	1	1
Anxiety	0	1	2
Insomnia	1	1	1
Other Indication	0	0	1
No Indication	0	0	0
Flurazepam			
Agitation	0	0	0
Anxiety	0	0	0
Insomnia	1	0	0
Other Indication	0	0	0
No Indication	0	0	0
Lorazepam			
Agitation	2	3	1
Anxiety	9	8	6
Insomnia	8	8	10
Other Indication[a]	2	1	5
No Indication	2	2	3

	Admission	*30 Days*	*60 Days*
Oxazepam			
Agitation	0	0	0
Anxiety	0	0	0
Insomnia	4	4	4
Other Indication	0	0	0
No Indication	0	0	0
Temazepam			
Agitation	0	0	0
Anxiety	0	0	0
Insomnia	3	3	2
Other Indication	0	0	0
No Indication	0	0	0
Triazolam			
Agitation	0	0	0
Anxiety	0	0	0
Insomnia	1	1	0
Other Indication	0	0	0
No Indication	0	0	0
Insomnia	0	0	0

[a]Other uses for which lorazepam was prescribed included one subject that was prescribed lorazepam for tension and one that was prescribed lorazepam for chest pain associated with agitation.

The dosages and frequency of dosing of benzodiazepines are presented in Table 4.5, which provides further data to answer the second question posed in this study.

Table 4.5

Dosage and Frequency of Dosing of Benzodiazepines Prescribed

	Dosage	*Percentage*	*(n)*	*Frequency of Dosing*	*Percentage*	*(n)*
Alprazolam	0.125-.25mg	10.0%	(1)	TID	30.0%	(3)
	0.25 mg	60.0%	(6)	TID PRN	20.0%	(2)
	0.5 mg	20.0%	(2)	Q4H PRN	10.0%	(1)
	1.0 mg	10.0%	(1)	QHS	30.0%	(3)
				STAT	10.0%	(1)
Flurazepam	15 mg	100.0%	(1)	QHS	100.0%	(1)

Continued on next page

	Dosage	*Percentage*	*(n)*	*Frequency of Dosing*	*Percentage*	*(n)*
Lorazepam	0.5 mg	31.4%	(22)	BID	2.8%	(2)
	1.0 mg	50.0%	(35)	BID PRN	20.0%	(14)
	0.5-1.0 mg	17.0%	(12)	TID PRN	20.0%	(14)
	2 mg	1.4%	(1)	Q4H PRN	1.4%	(1)
				Q4-6H PRN	4.3%	(3)
				Q6H PRN	11.4%	(8)
				QHS	18.6%	(13)
				QHS PRN	21.4%	(15)
Oxazepam	15 mg	50.0%	(6)	QHS	50.0%	(6)
	15-30 mg	25.0%	(3)	QHS PRN	50.0%	(6)
	30 mg	25.0%	(3)			
Temazepam	15 mg	25.0%	(2)	QHS	37.5%	(3)
	30 mg	75.0%	(6)	QHS PRN	62.5%	(5)
Triazolam	0.125 mg	100.0%	(2)	QHS	100.0%	(2)

Table 4.6

Average Number of Doses of Benzodiazepine Administered

	Average Number of Doses	*Standard Deviation*	*Range*
First Benzodiazepine			
0-30 Days	17.0	20.4	0-90
30-60 Days	20.8	26.9	0-90
Second Benzodiazepine			
0-30 Days	6.0	6.0	0-12
30-60 Days	4.4	9.3	0-22

Characteristics of the Sample

In relation to the third question, the older adults in this study ranged in age from 56 to 99 years of age, with an average age of 81.96 years (standard deviation ± 7.83 years). These older adults had varying abilities to maintain health and independent living as identified by the AAPI classification (Table 4.7).

Table 4.7

Identified AAPI Classification

AAPI Classification	*Percentage (n)*	
A	0.0%	(0)
B	28.4%	(40)
C	9.9%	(14)
D	18.4%	(26)
E	27.7%	(39)
F	5.7%	(8)
G	1.4%	(2)
Not Available	8.5%	(12)
Total	100.0%	(141)

The majority of the 141 subjects were female (Table 4.8), and widowed, separated or divorced (Table 4.9).

Table 4.8

Gender

Gender	*Percentage*	*(n)*
Male	30.5%	(43)
Female	69.5%	(98)
Total	100.0%	(141)

Table 4.9

Marital Status

Marital Status	*Percentage*	*(n)*
Widowed, Separated or Divorced	67.4%	(95)
Married	24.8%	(35)
Single	7.8%	(11)
Total	100.0%	(141)

The educational level (Table 4.10) of the sample ranged from no education to several years of post-secondary education.

Table 4.10

Educational Level

Educational Level	*Percentage*	*(n)*
None	2.1%	(3)
Grades 1-6	12.1%	(17)
Grades 7-9	18.4%	(26)
Grades 10-13	19.9%	(28)
College or University	15.6%	(22)
Other	2.8%	(4)
Not Available	29.1%	(41)
Total	100.0%	(141)

All of the 141 subjects had a diagnosis of one or more chronic illnesses (Table 4.11).

Table 4.11

Medical Diagnoses Identified on Chart Records

Medical Diagnoses Identified	*Percentage*	*(n)*
Arthritis[a]	48.2%	(68)
Osteoporosis	15.6%	(22)
Fracture	9.2%	(13)
Arteriosclerosis	31.9%	(45)
Hypertension	29.1%	(41)
Congestive Heart Failure	19.9%	(28)
Coronary Artery Disease	16.3%	(23)
Cardiovascular Diagnoses, Other[b]	20.6%	(29)
Cardiovascular Accident (CVA)	28.4%	(40)
Neurological Disorder	20.6%	(29)
Respiratory Disease	14.9%	(21)
Endocrine Disorders	27.7%	(39)
Gastrointestinal Disorders	26.2%	(37)
Urinary System Disorder	22.0%	(31)
Cancer	12.1%	(17)
Substance Abuse	2.8%	(4)
Medical Diagnoses, Other[c]	25.4%	(23)

[a]includes osteoarthritis
[b]does not include other cardiovascular diagnoses listed
[c]does not include other medical diagnoses listed

In addition to the medical diagnoses identified, 53.9% (n = 76) of the older adults in this study were identified as having a physical disability (i.e., impaired mobility). 82.3% (n = 116) of the older adults also were identified as having a mental illness or behavior problem. These diagnoses were not coded according to the DSM-IV classification scheme (APA, 1994), but by the label used on the chart record (Table 4.12).

Table 4.12

Percentages of Mental Illnesses Identified

Mental Illness	*Percentage*	*(n)*
Dementia[a]	38.5%	(53)
Alzheimer's Disease	21.3%	(30)
Depression	30.5%	(43)
Mental Illness Diagnoses, Other[b]	27.0%	(33)
Aggression	3.5%	(5)
Agitation	7.1%	(10)
Anxiety	9.2%	(13)

[a]includes all dementia identified in the chart records except Alzheimer's disease (e.g., organic dementia, substance-induced, mixed, multi-infarct, senile, etc.)
[b]includes various diagnoses, such as, schizophrenia, schizo-affective disorder, paranoid, dependent personality, hallucinations, personality problems, etc.

Relationship Between Benzodiazepine Use and Sample Characteristics

Although weak, significant ($p < .05$) relationships (Table 4.13) were noted between a diagnosis of aggression and benzodiazepine use at admission ($C = .17851$, $p < .05$); 30 days ($C = .18944$, $p < .05$); and 60 days ($C = .25940$, $p < .05$). Weak relationships ($p < .05$) also were noted between a diagnosis of Alzheimer's disease and benzodiazepine use at admission ($C = .18247$, $p < .05$) and 30 days ($C = .14180$, $p < .05$). In addition, weak relationships were established between AAPI category and benzodiazepine use at admission ($C = .26270$, $p < .05$) and between benzodiazepine use at 30 days after admission and cancer ($C = .26673$, $p < .05$) and coronary artery disease ($C = .18912$, $p < .05$). At 30 days after admission, a weak relationship also was noted between substance abuse and benzodiazepine use at 60 days after admission.

Table 4.13

Characteristics and Benzodiazepine Use Correlational Coefficients

	Admission		*30 Days*		*60 Days*	
	C	*p*	*C*	*p*	*C*	*p*
AAPI Category	**.26270**	**.02268***	.21916	.08932	.26415	.08496
Age	.08820	.298[2]	.12480	.140[2]	.16380	.052[2]
Gender	.04321	.60759	.02081	.80479	.01688	.84111
Education	.06122	.82854	.12569	.44819	.09717	.62091
Marital Status	.11808	.36906	.14973	.19852	.16631	.13460
Mental Illness[a]	.05975	.47726	.04485	.59395	.02225	.79153
Behavior Disorder[b]	.14417	.08362	.11626	.16456	.08970	.28485
Aggression	**.17851**	**03122*[1]**	**.18944**	**.02196*[1]**	**.25940**	**.00143*[1]**
Dementia[c]	.01199	.88680	.01870	.82423	.00864	.91830
Alzheimer's Disease	**.18247**	**.02755***	**.16942**	**.04122***	.14180	.08896
Depression	.10670	.20256	.13247	.11252	.02031	.80940
Substance Abuse	.16046	.05356	**.16739**	**.04379*[1]**	.15722	.05870
Mental Illness, Other	.08245	.32593	.06508	.43869	.13054	.11795
Chronic Illness[d]	.07643	.36273	.07320	.38348	.07803	.35267
Cardiovascular Diagnosis not CVA[e]	.01310	.87636	.00264	.97503	.07116	.39694

[a]category subsumes all mental illness diagnoses and behavior disorders
[b]category subsumes all behavior management problems
[c]category subsumes all dementia and dementia-type diagnoses
[d]category subsumes all chronic illness or disease except illness
[e]category subsumes all cardiovascular diagnoses except CVA

	Admission		*30 Days*		*60 Days*	
	C	*p*	*C*	*p*	*C*	*p*
Arteriosclerosis	.01582	.85100	.04054	.62997	.11338	.17539
Coronary Artery Disease	.09832	.24075	.11626	.16456	**.18912**	**.02220***[1]
CHF	.00185	.98249	.01959	.81601	.00670	.93661
Hypertension	.06562	.43485	.08356	.31942	.07574	.36711
Other Cardiovascular Diagnosis	.00730	.93095	.01061	.89978	.11050	.18678
CVA	.01881	.82324	.00224	.97880	.00781	.92608
Respiratory Disorder	.11927	.15373	.10774	.19816	.02967	.72453
Endocrine Disorder	.08867	.29048	.06917	.41030	.09808	.24187
GI Disorder	.04437	.59789	.06663	.42782	.07241	.38862
Musclo-Skeletal Diagnosis	.06348	.45004	.03236	.70065	.00999	.90558
Arthritis	.08528	.30945	.08872	.29021	.06669	.42738
Osteoarthritis	.01409	.86712	.01826	.82835	.00513	.95143
Osteoporosis	.11008	.18848	.12785	.12585	.20623	.12551
Cancer	.07340	.38215	.08832	.29238	**.26673**	**.00102***
Fracture	.13263	.11206	.08683	.30066	.00840	.92058
Urinary System Disorder	.01691	.84081	.00670	.93661	.03371	.68882
Neurological Disorders	.03555	.67270	.05451	.51684	.06865	.41389
Physical Disability	.02883	.73195	.00329	.96885	.05862	.48565

Note. *significant relationship [1]Fisher's Exact Test [2]Pearson's r correlation

Subjects who were initially prescribed a benzodiazepine were statistically ($p < .05$) more likely to be prescribed a benzodiazepine at 30 and 60 days after admission (Table 4.14).

Table 4.14

Correlational Coefficients of Benzodiazepine Use at admission, and 30 and 60 Days

	Admission		*30 Days*		*60 Days*	
	C	*p*	*C*	*p*	*C*	*p*
Benzodiazepine use at Admission	1.0000		.9575	.0000	.8119	.0000
Benzodiazepine use at 30 Days	.6916	.0000	1.0000		.8089	.0000
Benzodiazepine use at 60 Days	.8119	.0000	.8089	.0000	1.0000	

The Cochran Q test indicated that the probability of a benzodiazepine being prescribed at admission, and 30 and 60 days was the same for all three time periods ($Q = 1.4000$, $p < .05$).

Chapter 5

Discussion

The data collected and analyzed was sufficient to answer the questions identified for this study. This study provided a rich source of information regarding the prevalence of benzodiazepine use among older adults admitted to a long term care facility in the Edmonton area between January 1, 1994 and December 31, 1994. This study has not only provided information specific to this region, but has also provided the opportunity to compare and contrast the data collected with other data from other parts of Canada, the United States, and Australia.

Prevalence of Benzodiazepine Use

The prevalence of benzodiazepine use at admission (21.3%), and 30 days (19.9%) and 60 days (22.0%) after admission in this study is lower than reported by other studies which indicated that the use of benzodiazepines among long term care residents was 26% (Arlington et al., 1990), 34% (Morgan et al., 1982), and 45% (Robertson & Gray, 1990). The prevalence rate of benzodiazepines in this study was also lower than the rate identified for older adults seen in an outpatient clinic (66%, Geisselmann & Linden, 1991). Although higher than the prevalence rates of 5.1% - 16% reported for community dwelling older adults in the United States (Laurier et al., 1992; Morgan et al., 1988; Puryear et al., 1991), it is lower than the recently reported prevalence rates of 24% for community dwelling older adults in British Columbia (Thomson & Smith, 1995) and 30% for community dwelling older adults in Quebec (Angus & Turbayne, 1995). The lower prevalence rate identified in this study could

be attributable to several possible reasons. It is possible that there is an increased awareness regarding the adverse effects of benzodiazepines among older adults, and therefore, a decrease in the number of prescriptions. It is also possible that alternative methods, both pharmacological and nonpharmacological, were used instead of benzodiazepines.

Unlike the study completed by Garrard et al. (1992), which found a significant decrease in benzodiazepine use following a medical assessment and case conference among older adults admitted to a long term care facility, the prevalence rate in this study did not change significantly at either 30 days or 60 days after admission. In fact, there was no significant difference ($p \leq 0.05$) between the prevalence of benzodiazepines at admission (21.3%) and 30 days (19.9%) and 60 days after admission (22.0%) despite the protocol that a case conference be completed on all new residents within the first 45 days of residence. The length of time the benzodiazepines were prescribed (19.9% $\geq$ 30 days; 17.8% $\geq$ 60 days) is consistent with the literature that indicates that the majority of prescriptions for benzodiazepine are for more than 30 days (Garrard et al., 1992; Ray et al., 1991; Shorr et al., 1994). Perhaps the continuation of benzodiazepine use for more than 30 days, even after a case conference, indicates that the multidisciplinary team decided that the benzodiazepine was the most appropriate method to manage the signs and symptoms exhibited.

The most frequently prescribed benzodiazepine was lorazepam, followed by oxazepam, and alprazolam. This is consistent with the findings of other studies which

have found that there is an increase in the use of short acting versus long acting benzodiazepines among older adults (Garrard et al., 1992; Malcolm, 1992; Radecki & Brunton, 1993; Shor et al., 1994), however, the majority of the benzodiazepines were for lorazepam which has a slightly longer half-life (9-24 h) than oxazepam (6-25 h). It also has been suggested that oxazepam due to its water soluble properties and lower adverse effect profile, is preferable to both alprazolam and lorazepam in this age group (Hogan & McElhaney, 1994; Krogh, 1995; Gray, 1995).

It also is interesting to note that flurazepam and triazolam were infrequently prescribed for the older adults represented in this study. Flurazepam has a relatively long half-life of elimination and is more likely to result in daytime sedation and impaired psychomotor skills among older adults (Hogan & McElhaney, 1994; Maletta et al., 1991; Mental Health Foundation, 1991; McEvoy, 1995). Thus, there is an increased potential for injury among older adults who use this drug. The lack of temazepam prescriptions may indicate that the prescribers are aware of the adverse drug effects of benzodiazepines with longer half-lives and are prescribing benzodiazepines with shorter half-lives (e.g., oxazepam). Similarly, knowledge of the high risk of anterograde amnesia associated with triazolam use among older adults may account for the low number of triazolam prescriptions found in this study. This reflects the provincial prescribing practices which show that the number of triazolam prescriptions written between December, 1993 and February, 1994 decreased by approximately 50% from the same time period in 1990-1991 (Kirwin, 1994).

Although the number of older adults prescribed more than one benzodiazepine was relatively low at admission, and 30 and 60 days after admission (n = 5, 5, and 4 respectively), it was interesting to note that only one older adult had the second benzodiazepine discontinued at 60 days after admission. Three of the older adults prescribed two benzodiazepines received one for insomnia and the second one for either agitation, anxiety or another indication (e.g., chest pain). Other older adults were prescribed a benzodiazepine for the same reason but with different dosing frequencies (e.g., lorazepam was prescribed both BID and Q6H PRN). This practice is not recommended due to the additive effects associated with the concurrent use of two benzodiazepines (Hogan & McElhaney, 1994; Krogh, 1995; Maletta et al., 1991; McEvoy, 1995).

Also consistent with the literature, the most common reasons for the prescription of the benzodiazepines for older adults admitted to long term care facilities were for anxiety and insomnia (e.g., Gilbert et al., 1988). The following table lists the recommended indications for the benzodiazepines found in this study (see Table 5.1).

Table 5.1

Recommended Usage of Benzodiazepines

	Anxiety	*Insomnia*	*Seizures*	*Alcohol Withdrawal*	*Panic Disorder*
Alprazolam	✓				✓
Flurazepam		✓[a]			
Lorazepam	✓	✓[b]	✓	✓	✓
Oxazepam	✓	✓[b]		✓	
Temazepam		✓[c]			
Triazolam		✓[d]			

[a]for a period of no more than 4 weeks
[b]recommended in some sources but not others
[c]for a period of no more than 5 weeks
[d]for a period of no more than 7-10 days

In this study, some of the benzodiazepines were prescribed for indications for which they had not been approved. For example, lorazepam was the most frequently prescribed benzodiazepine for a variety of indications (Table 5.2), yet the use of lorazepam is neither indicated for symptoms of agitation nor for chest pain (Krogh, 1995; McEvoy, 1995). Additionally, lorazepam also was prescribed (n = 7) for no indicated reason. Although, some prescriber sources indicate that lorazepam can be used for insomnia, they also note that it may cause more adverse drug reactions among older adults and may cause worse rebound symptoms upon discontinuation than other

benzodiazepines (Krogh, 1995; Gray, 1995). Alprazolam and oxazepam were the other benzodiazepines that were prescribed for indications that have not been approved, such as agitation (n = 3).

Table 5.2

Indications for Benzodiazepine Use as Noted in Chart Records

	Agitation	*Anxiety*	*Insomnia*	*No Indication*	*Other*
Alprazolam	3 NR		3 NR		
Flurazepam			1 R		
Lorazepam	7 NR	23 R	26 R[a]	9 NR	5 NR
Oxazepam			12 NR		
Temazepam			8 R		
Triazolam			1 R		

Note. R = Recommended in the literature NR = Not recommended in the literature

[a]Recommended in some sources, but not others

The use of benzodiazepines for unapproved indications could be related to the prescribing practices of the physicians and/or the requests from nursing staff or residents and their families. It is recognized and documented that often the prescribing of drugs is directly related to the familiarity of the drug to the health care provider, as well as, past experience with the use of the drug (Arling et al., 1991; Farnsworth, 1990; Fritz & Stewart, 1990; Laurier et al., 1992; Pagliaro & Pagliaro, 1992; Puryear et al., 1991; Robertson, & Gray, 1991; Shorr & Bauwens, 1990; Surendrakuman et

al., 1992; Svarstad & Mount, 1991; Swartz et al., 1990; Tabisz, Jacyk, Fuchs, & Grymonpre, 1993; Tully & Tallis, 1991). These data were not collected in the study, but could account for the use of benzodiazepines for symptoms that have not been approved.

Generally, the dosage and frequency of administration of the benzodiazepines prescribed in this study fell within recommended guidelines as illustrated in Tables 4.4 and 4.5. Of note, however, was the high number of residents prescribed the maximum recommended dosage (Table 5.3). It was expected, based on the prescribing guidelines available (Beers et al., 1991; Hogan & McElhaney; Krogh, 1995; Maletta et al., 1991; McEvoy, 1995; Mental Health Foundation, 1991), that more residents would have been prescribed the minimum recommended dosage for benzodiazepines described in available guidelines. The maximum recommended dosages observed in this study may suggest that the resident was prescribed the benzodiazepine prior to admission and the same dosage continued following admission, or it could be related to the prescribing practices of physicians described above.

Table 5.3

Recommended Benzodiazepine Dosage and Frequency of Dosing Compared to Actual Prescribed Dosage and Frequency of Dosing

	Recommended	*Dosage*	*Percentage*	*(n)*	*Frequency of Dosing*	*Percentage*	*(n)*
Alprazolam	0.25 mg BID - TID[a]	0.125 - 0.25mg	10.0%	(1)	TID	30.0%	(3)
					TID PRN	20.0%	(2)
		0.25 mg	60.0%	(6)	Q4H PRN	10.0%	(1)
		0.5 mg	20.0%	(2)	QHS	30.0%	(3)
		1.0 mg	10.0%	(1)	STAT	10.0%	(1)
Flurazepam	15 mg QHS	15 mg	100.0%	(1)	QHS	100.0%	(1)
Lorazepam	**Anxiety**: 0.5 - 2 mg/ day in divided doses: BID - TID	0.5 mg	31.4%	(22)	BID	2.9%	(2)
		1.0 mg	50.0%	(35)	BID PRN	20.0%	(14)
		0.5-1.0 mg	17.2%	(12)	TID PRN	20.0%	(14)
	Insomnia: 1 - 2 mg QHS	2 mg	1.4%	(1)	Q4H PRN	1.4%	(1)
					Q4-6H PRN	4.3%	(3)
					Q6H PRN	11.4%	(8)
					QHS	18.6%	(13)
					QHS PRN	21.4%	(15)

	Recom-mended	*Dosage*	*Percentage*	*(n)*	*Frequency of Dosing*	*Percentage*	*(n)*
Oxazepam	10 mg TID, may increase to 15 mg TID - QID	15 mg	50.0%	(6)	QHS	50.0%	(6)
		15 - 30 mg	25.0%	(3)	QHS PRN	50.0%	(6)
		30 mg	25.0%	(3)			
Temazepam	7.5 mg - 15 mg QHS	15 mg	25.0%	(2)	QHS	37.5%	(3)
		30 mg	75.0%	(6)	QHS PRN	62.5%	(5)
Triazolam	0.125 mg QHS	0.125 mg	100.0%	(2)	QHS	100.0%	(2)

[a]if adverse effects do not occur, dosage may be gradually increased if necessary

The frequency of drug administration is usually dependent on the reason for the drug prescription. For example, benzodiazepines used for insomnia should be given at bedtime (HS), whereas, benzodiazepines that are prescribed for anxiety disorders should be prescribed on a regular interval schedule (e.g., BID, TID) in order to maintain optimal therapeutic blood levels and to achieve the desired pharmacological drug action. In this study, it was noted that few of the benzodiazepines were prescribed in accordance with recommended guidelines or pharmacokinetic principles. Although all of the drugs ordered for the pharmacological management of insomnia were ordered to be given at bedtime, it would be expected that the benzodiazepines would have been prescribed for administration once every 2-3 days, as recommended

that were prescribed for insomnia were prescribed to be given at bedtime, as needed (QHS PRN; 52.8%), or on a nightly basis (QHS; 47.2%). Similarly, the majority of the benzodiazepines prescribed for indications other than insomnia were prescribed on a PRN basis. Only 11.8% of the benzodiazepines prescribed for the management of anxiety were ordered to be given on a regularly scheduled regime (e.g., BID, TID) that would provide therapeutic blood levels on a continuous basis. It is likely that the majority of the benzodiazepines were given only in isolated incidents to manage problematic symptoms and behaviors in this study. This is supported by the actual number of benzodiazepine doses administered to the older adults in this long term care facility (see Table 4.6).

Despite the high prevalence of benzodiazepine prescribing (approximately 1 out of every 5 residents), there was a considerable difference in the amount of benzodiazepines actually administered. For example, the number of doses of benzodiazepines actually administered ranged from 0-90 doses for both the first and second thirty days after admission. This range is likely reflective of the way in which the benzodiazepines in this study were prescribed. That is, benzodiazepines ordered on an "as needed" basis (PRN) were not administered on a regular basis, either because the signs and symptoms for which the benzodiazepine was ordered to treat were not present, or because alternative nursing interventions were used to manage the signs and symptoms exhibited for which the drug was prescribed. For example, if a resident was prescribed a benzodiazepine for insomnia, but did not receive any doses, there may be several possible explanations: 1.) the client did not experience any

insomnia, and therefore did not require the drug; 2.) the client experienced insomnia, but the nursing staff provided other methods to relieve this condition (e.g., back rub, reading, warm milk, watching T.V., etc.); 3.) the client experienced insomnia, but did not receive alternative therapy or the prescribed drug. Unfortunately, this information was not documented in the chart records and was not collected as part of this study.

Characteristics of the Sample

In this study, not surprisingly, there were more woman than men (see Table 4.8) and the majority of the residents were either widowed, separated or divorced (see also, Table 4.9). In fact, there was no significant difference ($p < .05$) when the characteristics of the convenience sample were compared to those of long term care residents in the province of Alberta based on average age, gender and marital status (Long Term Care Branch, 1994) (Table 5.4).

Table 5.4

Comparison of Sample Age, Gender, and Marital Status to Provincial Data

Characteristic	*Sample*	*Provincial Data*	*Test Statistic*
Age	81.96	81.84	$t = 1.24$, $p = .217$[a]
Gender			$\chi^2 = .284$, $p = .594$[b]
Male	30.5	32.6	
Female	69.5	67.4	
Marital Status			$\chi^2 = 2.8177$, $p = .2444$[c]
Never Married	7.8	12.4	
Married	24.8	22.7	
Divorced, Separated or Widowed	67.4	64.9	

[a]One sample t-test, df=140
[b]Chi-square, df=1
[c]Chi-square, df=2

However, the prevalence of chronic and mental illness identified in the sample was higher than those recorded in the Long Term Classification Data (Long Term Care Branch, 1994). This finding could be related to the method by which data were collected during the classification process versus the diagnoses assigned by the physician. That is, during the classification process, auditors are given specific criteria by which to determine the diagnoses of chronic and mental illness which may be different than the diagnostic criteria used by physicians in this study.

Surprisingly, the majority of admissions fell within the AAPI categories of B (28.4%), D (18.4%), and E (27.7%), with only 7.1% of the sample falling within the F or G categories. Considering the emphasis on maintaining older adults in their own homes or apartments for as long as possible, it was expected that there would be a greater percentage of the sample in the F and G categories. Therefore, it is interesting to note that 28.4% of the sample were classified within the AAPI category B. Missing AAPI category data from the chart records (n = 9) may partially account for this observed distribution or, alternatively, this information may be consistent with all new admissions to long term care facilities in Alberta. Unfortunately, this admission data, including AAPI category, is not collected on a provincial basis and was consequently not available for access by the researcher for making comparison. It is possible that because the majority of admissions to long term care facilities come from their own homes and apartments these older adults may have maintained a level of self-care which results in AAPI categories of A or B. Perhaps it is only after admission that a significant decline in self-care abilities occurs which would result in an AAPI category of D, E, F or G recorded during the long term care classification process.

The AAPI scores observed in this study also could be related to the types of medical diagnoses identified on admission. A large percentage of the older adults in this study were diagnosed with arthritis and/or cardiovascular disease which can cause progressive decline in the older adult's ability to maintain health and independent living that eventually prevents them from living in more independent environments (e.g.,

lodge, senior's apartment). The inability to continue to reside in more independent environments may also be reflective of the high percentage (53.9%) of older adults that were identified on admission as having a physical disability. This rate is in contrast to the caregiver information which identified that only 37.5% of the sample were admitted due to physical disability which may indicate that there is a difference in the perception of physical disability between the health care professional completing the admission records and the former caregiver in the community setting. It is possible that the caregiver perceives the resident in a more positive manner, identifying physical disabilities only if they become a major barrier to the older person's self-care and independence.

Relationship between Benzodiazepine Use and Sample Characteristics

The lack of significant ($p < .05$) relationships between benzodiazepine use and the sample characteristics found in this study are consistent with results reported by Puryear et al., (1991). In their study of 118 older adults seen in an urban psychiatric emergency room, no relationship between benzodiazepine use and depression, race, gender, or age was noted. The results of this study are contrary, however, to other studies that indicate that benzodiazepine use is related to age (Garrard et al., 1992; Hendricks, Johnson, Sheahan, & Coons, 1991; Perodeau et al., 1992; Shorr & Bauwens, 1990; Swartz et al., 1991); gender (Glanz & Backenheimer, 1988; Isacson et al., 1993; Morgan et al., 1982; Perodeau, King & Ostoj, 1992; Smart & Adalf, 1988; Swartz et al., 1991); marital status (Swartz et al., 1991); and education level (Swartz et al., 1991).

Despite the high prevalence of chronic illness identified in this sample (100%), only weak relationships were noted between a prescription for benzodiazepines and cancer, coronary artery disease, and substance abuse (see also Table 4.13). No other chronic illness or physical disability was related to the prevalence of benzodiazepine use which is inconsistent with the findings in other studies (Arling et al., 1991; Hendricks et al., 1991; Heston et al., 1992; Laurier et al., 1992; Sorock & Labiner, 1992). Although the use of benzodiazepines has been related to a higher incidence of falls in previous studies (Aisen et al., 1992; Angus & Turbayne, 1995; Ray et al., 1991; Ryynanen et al., 1993; Sorock & Labiner, 1992), a significant relationship between benzodiazepine use and the Morse Fall Scale Score was not noted in this study. This would be an expected outcome considering that although the Morse Fall Scale is designed to identify individuals at high risk of falling, it does not include the use of benzodiazepines as a variable. Information related to the actual number of falls that occurred during the first 60 days following admission was not collected in this study because it was not available in the chart records, therefore, a relationship could not be established between benzodiazepine use and falls.

Unlike previous studies (Laurier et al., 1992; Svarstad & Mount, 1991), few significant relationships were noted between benzodiazepine use and a mental illness diagnosis in the long term care facility accessed for this study. Although weak, a significant relationship was observed between the identification of aggressive behavior and benzodiazepine use at all three time periods (admission, 30, and 60 days). It is particularly interesting to note that this diagnosis did not include other behavioral

problems such as agitation. Inappropriate use of benzodiazepines to control aggressive behavior and agitation, despite the lack of research to substantiate this practice, also has been identified in previous studies (Abrams & Alexopoulous, 1987; Ancill et al., 1991; Fritz & Stewart, 1990; Glanz & Backenheimer, 1988; Kane & Lieberman, 1994). Both alprazolam and lorazepam have been noted to be used for older adults who exhibit aggressive behavior despite documentation that indicates that other drugs in small dosages, may be more effective (e.g., antipsychotics), especially among older adults with cognitive impairment (Gray, 1995; Yudofsky et al., 1990). In addition, the use of benzodiazepines may precipitate or exacerbate aggressive behavior (Ancill et al., 1991; Burch, 1990; Smith, 1991; Yudofsky et al., 1990). Although many of the older adults identified as exhibiting "aggression" were prescribed a benzodiazepine, in this study, other behavioral problems such as agitation were not related to benzodiazepine use. Significant relationships between these diagnoses and benzodiazepine use either as separate variables or subsumed under one variable also were not identified.

Similar to aggression, a weak relationship also was noted between a diagnosis of Alzheimer's disease and benzodiazepine prescribing at admission and 30 days following admission although other types of dementia (e.g., mixed, multi-infarct, organic, senile, substance-induced) were not related to benzodiazepine use either as individual variables or when subsumed under the broader variable "dementia". Although no drug is currently approved in Canada for the treatment of Alzheimer's disease, it has been suggested by some authors that the short-term use of

benzodiazepines to manage the problematic behaviors (e.g., agitation, disturbed sleep/wake cycle) associated with the disease may be helpful (Gray, 1995). Other authors disagree with the use of benzodiazepines due to the potential increase in cognitive impairment and exacerbation of the symptoms for which the benzodiazepine has been prescribed (Abrams & Alexopoulous, 1987; Ancill et al., 1991; Angus & Turbayne, 1995; Fritz & Stewart, 1990; Glanz & Backenheimer, 1988; Kane & Lieberman, 1994; Stern et al., 1991; Thomas, 1988).

Interestingly, although anxiety was identified as one of the reasons for which the benzodiazepines were prescribed, a significant relationship was not observed between a diagnosis of anxiety and benzodiazepine use at either admission, 30 days or 60 days after admission. It is possible that the older adults who had a diagnosis of anxiety were not identified as receiving any benefit from benzodiazepines, or were treated with nonpharmacological approaches, and therefore, did not receive a prescription. Additionally, although the benzodiazepine may have been prescribed to manage anxious behavior, a formal diagnosis of anxiety was not made and identified on the chart. Consequently, those prescribed a benzodiazepine for the management of anxiety without a formal diagnosis may not be identified as benefiting from other, nonpharmacological treatment approaches. It also is possible that the anxiety was not present prior to or at admission, but developed following admission in response to the change in living environment.

Limitations

Although the convenience sample chosen seems to represent the larger population and provided data to answer the questions posed by this research study, this type of sampling methodology limits the generalizability of the findings. However, it can be argued that due to the admission procedures, this sample was sufficiently heterogeneous and generally reflective of long term care residents within the greater Edmonton area (Alberta Health, 1990). That is, all applications for long term placement are reviewed by Central Agency Placement (CAPs) which then forwards the applications of residents to long term care facilities based on bed availability. Although applicant preference is considered, the criteria primarily used for admission is need for long term care placement.

Therefore, because the resident applications are submitted from across the Edmonton area and are assigned to long term care facilities based on bed availability, this study's sample can be expected to have a suitable variation of participants that would be generally representative of all older adults admitted to other long term care facilities in the Edmonton area during the same general time period. Furthermore, information provided by the Long Term Care Branch (Long Term Care Branch, 1994) also indicates that this sample is not significantly different from long term care residents in the province of Alberta in regard to age, gender, and marital status (see Table 5.1). However, significant differences do exist between the sample data and the provincial statistics in regards to the prevalence of chronic physical and mental illness. Consequently, caution should be used in generalizing the findings from this study to other population samples.

The data analysis of some variables in this study was limited due to the lack of data on some of the chart records (e.g., AAPI score). Although this limitation did not seriously affect the study, it may have identified more older adults in the higher AAPI categories (Table 4.7) which would have been more reflective of the provincial data (Long Term Care Branch, 1994). The incompleteness of data from the chart record is likely a result of several possible reasons: 1.) data were not initially collected on the AAPI by the assessment collector or was unavailable, unknown, or omitted; 2.) data were lost or misfiled during the admission; and/or 3.) residents that were admitted previous to their most recent admission (e.g., short-term respite admission) did not have their AAPI updated upon their more recent admission. Unfortunately, because this was a retrospective study that included only the chart records of residents, this method precluded the completion of the data sets through interviews with the resident, the resident's family, and health care staff, or accessing previous health care records. The inclusion of these sources of information into the data collection methodology may have allowed for the collection of information not available on some chart records (e.g., AAPI category, education level).

Another major limitation in this study was that information related to prescriber characteristics was not included. In this study, this information was not collected because it was identified that the inclusion of some data may reduce the anonymity and confidentiality of the sample. After analyzing the data, it is clear that prescriber preferences may influence the prescribing of benzodiazepines, including the type, dosage, and frequency of administration. Additionally, data that were not collected

due to the retrospective design of the study, but may be related to the use of benzodiazepines include, the number of staff available to care for the long term care residents, other nonpharmacological and nursing interventions delivered, knowledge regarding the pharmacological aspects of benzodiazepines, and family and resident requests for benzodiazepines. As suggested by previous studies, the benzodiazepines may be prescribed among older adults in long term care facilities because of a lack knowledge regarding the pharmacological aspects of benzodiazepines (Avron et al., 1992; Hartlaub et al., 1993). Although Hartlaub et al. (1993) determined that educational programs did not influence the prescribing practices of physician, Avorn et al. (1992) concluded that an educational program delivered to all members of the multi-disciplinary team in a long term care facility did reduce the use of benzodiazepines. Other studies also have identified that benzodiazepines may be used to decrease the amount of facility resources required to care for the older adults residing in long term care facilities (e.g., Arlington et al., 1990). This information was not available in the chart records and could not be addressed through the retrospective research design of this study.

Chapter 6

Summary, Recommendations, and Conclusions

Summary

This study identified the prevalence of benzodiazepine use among older adults in a long term care facility and the characteristics of the older adults. Unfortunately, like other studies of the prevalence of benzodiazepines at other long term care facilities, it appears that benzodiazepines were sometimes prescribed to the older adults in this sample for periods of time longer than the recommended 30 days, and for indications for which they have not been approved or have demonstrated little efficacy. Unfortunately, this is a practice that has the potential to place older adults at increased risk for reduction in their self-care abilities (e.g., cognitive and psychomotor impairment). However, in other cases the benzodiazepines like flurazepam, which are not recommended for use among older adults, were discontinued or prescribed infrequently.

From the results of this study, it is difficult to determine those older adults who would be at risk or not at risk for benzodiazepine use; however, weak relationships were established between benzodiazepine use and aggressive behavior at all three time periods and between benzodiazepine use and Alzheimer's disease at admission and 30 days following admission. A significant relationship also was established between benzodiazepine use at admission and AAPI category; and benzodiazepine use at 60 days following admission and cancer and coronary artery disease. There were no significant relationships established between benzodiazepine use and age, gender,

marital status, educational level, chronic illness or physical disability. Although the limitations of this study are recognized and more research is required, several recommendations can be made.

Recommendations

Long Term Care Facilities

Based on the results obtained from this study, as well as in other studies published in the literature, it is recommended that all residents entering a long term care facility have a complete drug profile completed with attention to the provision of indications for each drug prescribed. Those residents for whom no indication for benzodiazepine use is identified, should not continue to have the drug prescribed. As indicated in the literature, benzodiazepines should only be prescribed if the symptoms for which they are given cause significant impairments in the ability of older adults to manage their health and well-being (Closser, 1991; Krogh, 1995; Miller, 1995). For older adults for whom there is no identified need, discontinuation of the drug should be achieved through the initiation of a gradual tapering regime (Hogan & McElhaney; McEvoy, 1995, Maletta, et al., 1991; Mental Health Foundation , 1991; Rickels & Schweizer, 1991; Rifkin, 1990; Schweizer, Rickels, Case, & Greenblatt, 1990). In addition, until more studies identify the effectiveness and safety of benzodiazepines in the management of aggressive behavior and other behavioral disorders, it is recommended that more attention be given to the use of benzodiazepines for these conditions.

For those residents who require a benzodiazepine, in conjunction with other nonpharmacological interventions, to manage the short term anxiety or insomnia associated with a move into the long term care facility, it is recommended that a water soluble benzodiazepine with a short half-life be prescribed at the minimum recommended dosage and frequency for a period of no more than 30 days (Beers et al., 1991; Hogan & McElhaney, 1994). It is also recommended that prior to the prescribing of a benzodiazepine, alternative nonpharmacological interventions such as improvement in sleep hygiene practices and psychotherapy be implemented with documentation as to positive or negative effect (Miller, 1995; Polypharmacy..., 1994).

In addition, the use of all benzodiazepines should be reviewed after 30 days and discontinued, if appropriate, through a tapering method. The use of PRN drugs such as benzodiazepines, should also be reviewed on a regular basis and discontinued if not needed. Although PRN drugs are often ordered to improve the efficiency of a long term care facility, sleep disturbances and anxiety, for which most older adults are prescribed benzodiazepines, can be an indication of an underlying disorder (e.g., cardiac insufficiency, depression, infection, or pain) or the result of an adverse drug reaction (Miller, 1995). A resident that has an order for a benzodiazepine "just in case", may be administered the drug while the underlying problem goes undetected. The determination of the underlying cause of the presenting signs and symptoms would provide the opportunity to address the problem through more appropriate methods (e.g., analgesic for pain) and would possibly prevent further illness and injury.

Additionally, it is recommended that educational sessions for staff, residents, resident families and physicians be conducted to inform these people about the effects of benzodiazepines among older adults, including, indications for use, adverse drug reactions, and alternative nonpharmacological interventions to manage the signs and symptoms exhibited by older adults.

There has been some suggestion that a mechanism to monitor the prescribing patterns of benzodiazepines, similar to the triple prescription program currently used in Alberta for opiate analgesics (e.g., morphine), should be implemented. Unfortunately, although the implementation of this type of strategy may decrease the amount of benzodiazepines prescribed, it may not necessarily lead to a decrease in the number of adverse drug reactions associated with pharmacotherapy. For example, although the extension of the triple prescription program in the state of New York to include benzodiazepines in 1989 did decrease the prevalence of benzodiazepine in long term care facilities, Zullich et al. (1992) found that there was also a corresponding increase in alternative drugs (e.g., chloral hydrate, haloperidol). Although this may indicate that more appropriate drug therapy is being utilized (e.g., use of haloperidol to control aggressive behavior), it may indicate that other drugs, not requiring a triple prescription, were being substituted for benzodiazepines.

Perhaps the implementation of a policy requiring a review and consultation by a clinical expert in geriatric pharmacopsychology prior to the initiation of drug therapy with benzodiazepines would be another alternative to help decrease the amount of inappropriate prescriptions of benzodiazepines in long term care facilities. A

monitoring system similar to the computerized program proposed by Beers, Fingold and Ouslander (1992) to monitor inappropriate and problematic drug use among older adults in long term care facilities could also be implemented.

Future Research

Future research should be directed at determining the prevalence rates of benzodiazepine use in the community and to determine if a relationship exists between benzodiazepine use and admission to a long term care facility. Other studies which examine the use and prevalence of benzodiazepines over time are also recommended. Prospective studies which explore the relationship of benzodiazepines to a reduction in self care agency (e.g., reduction in cognitive ability and psychomotor skills) and the adverse drug reactions currently described in case reports should also be completed.

Studies that identify the prescribing practices of physicians, as well as, the effect of nonpharmacological nursing interventions on the management of anxiety, aggressive behavior, and insomnia are also recommended. Not only do nurses influence the prescribing of drugs to residents, they are also able to use non-drug interventions to manage problematic behaviors such problems as aggression, insomnia, and anxiety (Miller, 1995; Monane, 1992). Moreover, it would be important to determine if the prevalence of benzodiazepine use decreased following supportive-educational programs aimed at such issues as drug induced injury and management of anxiety or insomnia. In addition, the prevalence of benzodiazepine use may be related to the requests of the resident and/or the family (Closser, 1991, Farnsworth, 1990, Glanz & Backenheimer, 1988). It also would be important to determine if the

provision of educational sessions and information to the residents and their families regarding the use of the benzodiazepines, the adverse drug effects, drug interactions and nonpharmacological interventions for problematic symptoms, would reduce the prevalence of benzodiazepine use among older adults in long term care facilities as was demonstrated by Gilbert et al. (1993).

Conclusion

The prevalence and inappropriate use of benzodiazepines among older adults is not limited to this study, it is a widespread problem throughout Canada (Angus & Turbayne, 1995; Thomson & Smith, 1995). As noted in a recent report:

> Up to 20 per cent of hospital admission are thought to be attributable to medication misuse and preventable adverse drug reactions. Rachlis and Kushner (1994) state that poor prescribing causes over 50, 000 hospital admissions per year. Statistics Canada estimated that 4, 000 Canadian seniors died in 1989 as a result of inappropriate drug use (Decter, 1994), and Warren Davidson, a Moncton geriatrician who conducted a study of seniors' drug use in New Brunswick, was quoted in The Globe and Mail (June 1, 1994) as saying "seniors are being drugged silly". CBC radio reported recently that some elderly were found to have been diagnosed with Alzheimer's disease when the symptoms were caused by inappropriate medication (CBC Radio, Edmonton AM, March 1, 1995)" (Angus & Turbayne, 1995).

Although this report does not specifically address benzodiazepines, due to the prevalence of use in this study and others, it is likely that a proportion of the adverse effects identified are related to benzodiazepine use. The provision of optimal care, including pharmacotherapy, that maximizes the ability of older adults to manage their health and well-being despite complex medical and psychological diagnoses is not easy. Simply providing, or requesting an order (as in the case of nurses or other caregivers) for "the prescriber's or caregiver's drug of choice" to manage the identified problem or diagnoses is not adequate. Unless improvement of prescribing practices and the management of drug therapy are addressed, older adults will continue to be at risk for decreased abilities to manage their health and well-being in more independent living environments in Canada (Angus & Turbayne, 1995).

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APPENDIX A

Definition of Terms used in this Thesis

Term	Definition
Benzodiazepines	a group of sedative-hypnotics that have a common molecular structure and share similar pharmacological properties such as sedation, hypnosis, anxiolytic effect, and muscle relaxation.
Long Term Care Facility	a health care facility for people who are unable to safely meet their personal care activities in their home, apartment or lodge setting. In Alberta, long term care facilities are monitored by the Long Term Care Branch of Alberta Health and must meet minimum standards of care. Formerly known as auxiliary hospitals or nursing homes, long term care facilities generally have a mixture of older adults that require varying levels of care. People seeking admission to a long term care facility must be assessed by a registered assessor using Alberta Assessment and Placement Instrument for Long Term Care (AAPI) which is reviewed by a regional facility placement committee.
Nursing System	a series of deliberate nursing actions performed in coordination with patient actions aimed at knowing and meeting the self-care demands of the latter and to protect

	and regulate the exercise or development of self-care agency.
Older Adults	people who are 55 years of age or older.
Partially Compensatory Nursing System	the system in which both the nurse and the patient (older adult) perform self-care activities related to manipulative tasks or ambulation. The distribution of responsibility for the performance of self-care activities is negotiated between the nurse and the patient and is dependent on the ability of the patient.
Self-Care	the practice of activities that are initiated and performed in the interest of maintaining healthful functioning, life, personal development, and well-being (Orem, 1991)
Self-Care Agency	the acquired ability of individuals to know and meet the activities required to maintain healthful functioning, life, personal development, and well-being
Self-Care Deficit	the condition in which the ability to complete the activities required to maintain healthful functioning, life, personal development, and well-being by the individual (self-care agency) is inadequate.
Supportive-Educative Nursing System	the provision of care to assist the patient to successfully and independently meet self-care needs; includes: advocating, coaching, guiding, instructing, and providing positive

	affirmation.
Therapeutic Self-care Demand	the summation of all activities required to maintain healthful functioning, life, personal development, and well-being of older adults. The inability of older adults to complete these activities may result in a need for nursing care (nursing system).
Wholly Compensatory Nursing System	the system in which the provision of nursing care to an individual that is unable to engage in self-care activities due to reduced physical and/or cognitive abilities.

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APPENDIX B

Benzodiazepine Use among Older Adults Admitted to Long Term Care Facilities:

Data Collection Instrument

Subject ID Number (year of birth, day and month of admission, initial of first name):_____1

Benzodiazepine Use

Use of benzodiazepine at admission no ___ yes ___

1. Name _____ Dose _____ Frequency _____

2. Name _____ Dose _____ Frequency _____

3. Name _____ Dose _____ Frequency _____

Reason indicated for benzodiazepine use

	1	2	3
Anxiety			
Insomnia			
Muscle Relaxation			
Seizure Control			
No Indication for Use			
Other (specify)			

Use of benzodiazepine 30 days after admission no ___ yes ___

1. Name _____ Dose _____ Frequency _____

2. Name _____ Dose _____ Frequency _____

3. Name _____ Dose _____ Frequency _____

Reason indicated for benzodiazepine use

	1	2	3
Anxiety			
Insomnia			
Muscle Relaxation			
Seizure Control			
No Indication for Use			
Other (specify)			

Use of benzodiazepine 60 days after admission no ___ yes ___

1. Name _____ Dose _____ Frequency _____

2. Name _____ Dose _____ Frequency _____

3. Name _____ Dose _____ Frequency _____

Reason indicated for benzodiazepine use

	1	2	3
Anxiety			
Insomnia			
Muscle Relaxation			
Seizure Control			
No Indication for Use			
Other (specify)			

Older Adult Variables

AAPI Score _____ Category _____

Reason(s) for admission_____

_____

Age at time of admission: _____

Gender: Female___ Male ___

Highest Education Level: Grade: 1-6 ___ College___
7-9 ___ University___
10-12 ___ Other (specify)_____

Marital Status:

	Admission	30 Days	60 Days
Single			
Common Law			
Married			
Separated			
Widowed			

	ADMISSION		30 DAYS		60 DAYS	
	No	**Yes (Specify)**	**No**	**Yes (Specify)**	**No**	**Yes (Specify)**
Chronic Illness						
Confusion						
Depression						
Mental Illness						
Physical Disability						
Other						

Date Data Collected:_____
Data Collector:_____
Date Coded:_____
Coder:_____

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APPENDIX C

Benzodiazepine Use among Older Adults Admitted to Long Term Care Facilities:
Data Collection Instrument - Revised

1. Subject ID Number: _____

2. Admission Date:_____ 3. Discharge Date_____ 4. Length of Stay_____

5. Reason(s) for admission_____

_____

6. Reason for discharge_____

7. AAPI Score _____ 8. Category _____

9. Age at time of admission: _____ 10. Date of Birth _____

11. Gender: Female ___ Male ___

12. Highest Education Level: Grade: 1-6___ College___
7-9 ___ University___
10-12___ Other (specify)_____

13. Marital Status:

	Admission	30 Days	60 Days
Single			
Common Law			
Married			
Divorced			
Separated			
Widowed			

	ADMISSION		30 DAYS		60 DAYS	
	No	Yes (Specify)	No	Yes (Specify)	No	Yes (Specify)
14. Mental Illness Aggression						
Anxiety						
Dementia						
Depression						
Other						
15. Chronic Illness Arteriosclerosis						
CVA						
CHF						
Diabetes						
Hypertension						
Osteoarthritis						
Osteoporosis						
Parkinson's Disease						
PVD						
Other						
16. Morse Fall Scale Score						
17. Physical Disability						
18. Other						

19. Use of benzodiazepine at admission no___ (If no, go to Item 22) yes___

a. Name _____ Dose_____ Frequency _____
b. Name _____ Dose_____ Frequency _____
c. Name _____ Dose_____ Frequency _____

20. Reason indicated for benzodiazepine use

	a	b	c
Anxiety			
Insomnia			
Muscle Relaxation			
Seizure Control			
No Indication for Use			
Other (specify)			

21. Number of Doses 0-30 Days:

a	b	c

22. Use of benzodiazepine 30 days after admission: no ___(If no, go to Item 25) yes___

a. Name _____ Dose_____ Frequency _____
b. Name _____ Dose_____ Frequency _____
c. Name _____ Dose_____ Frequency _____

23. Reason indicated for benzodiazepine use

	a	b	c
Anxiety			
Insomnia			
Muscle Relaxation			
Seizure Control			
No Indication for Use			
Other (specify)			

24. Number of Doses 30-60 Days:

a	b	c

25. Use of benzodiazepine 60 days after admission no ___(If no, go to Item 27) yes___

a. Name _____ Dose_____ Frequency _____
b. Name _____ Dose_____ Frequency _____
c. Name _____ Dose_____ Frequency _____

26. Reason indicated for benzodiazepine use

	a	b	c
Anxiety			
Insomnia			
Muscle Relaxation			
Seizure Control			
No Indication for Use			
Other (specify)			

27. Date Data Collected:_____
28. Data Collector:_____
29. Date Coded:_____
30. Coder:_____

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APPENDIX D

Data Dictionary

Variable Name — Position

FACILITY Facility — 1
Print Format: F1
Write Format: F1

Value	Label
1	Good Samaritan Auxiliary Hospital
2	Good Samaritan Nursing Homes (MP, SG, SP)

ID Subject Identification Number — 2
Print Format: F6
Write Format: F6

ADDATE Date of Admission — 3
Print Format: EDATE8
Write Format: EDATE8

DISDATE Date of Discharge — 4
Print Format: EDATE8
Write Format: EDATE8

LOS Length of Stay — 5
Print Format: F3
Write Format: F3
Missing Values: 888

Value	Label
888 M	current admission

ADREMOR1 More than one reason for admission — 6
Print Format: F1
Write Format: F1

Value	Label
1	yes
2	no

DCREASON Reason for Discharge 7
Print Format: F1
Write Format: F1

Value	Label
1	death
2	transfer
9	not applicable

AAPICAT AAPI Category 8
Print Format: F1
Write Format: F1
Missing Values: 8

Value	Label
2	A & B
3	C
4	D
5	E
6	F & G
8 M	not available

AGE Age 9
Print Format: F3
Write Format: F3

Value	Label
1	55-74
2	75-84
3	85-100

GENDER Gender 10
Print Format: F1
Write Format: F1

Value	Label
1	Male
2	Female

EDUCATN Highest Educational Level 11
Print Format: F1
Write Format: F1
Missing Values: 8

Value	Label
1	None to Grades 9
2	Grades 10-13
3	Post-secondary
8 M	Unknown

MARSTAT Marital Status 12
Print Format: F1
Write Format: F1
Missing Values: 8

Value	Label
1	single, separated or divorced
3	married or common law
6	widowed
8 M	unknown

MENTAL Mental Illness Diagnosis 13
Print Format: F1
Write Format: F1

Value	Label
1	yes
2	no

BEHAVIOR Behavior Disorders 14
Print Format: F1
Write Format: F1

Value	Label
1	yes
2	no

DEMENTIA Dementia 15
Print Format: F1
Write Format: F1

Value	Label
1	yes
2	no

DEPRESSI Depression 16
Print Format: F1
Write Format: F1

Value	Label
1	yes
2	no

OTHMENTA Other Mental Illness not Previously Identified 17
Print Format: F1
Write Format: F1

Value	Label
1	yes
2	no

CHRONIC Chronic Illness or Disease 18
Print Format: F1
Write Format: F1

Value	Label
1	yes
2	no

CVDIAGNO Cardiovascular Diagnosis not CVA 19
Print Format: F1
Write Format: F1

Value	Label
1	yes
2	no

ARTERIOS Arteriosclerosis 20
Print Format: F1
Write Format: F1

Value	Label
1	yes
2	no

CHF CHF 21
Print Format: F1
Write Format: F1

Value	Label
1	yes
2	no

HYPERTEN Hypertension 22
Print Format: F1
Write Format: F1

Value	Label
1	yes
2	no

OTCVDIAG Other Cardiovascular Diagnosis 23
Print Format: F1
Write Format: F1

Value	Label
1	yes
2	no

CVA CVA 24
Print Format: F1
Write Format: F1

Value	Label
1	yes
2	no

RESP Respiratory Disorders 25
Print Format: F1
Write Format: F1

Value	Label
1	yes
2	no

ENDO Endocrine Disorder 26
Print Format: F1
Write Format: F1

Value	Label
1	yes
2	no

GIDISORD Gastrointestinal Disorders 27
Print Format: F1
Write Format: F1

Value	Label
1	yes
2	no

MSDIAGN Musculo-Skeletal Diagnosis 28
Print Format: F1
Write Format: F1

Value	Label
1	yes
2	no

ARTHRITI Arthritis 29
Print Format: F1
Write Format: F1

Value	Label
1	yes
2	no

OSTEOART Osteoarthritis 30
Print Format: F1
Write Format: F1

Value	Label
1	yes
2	no

OSTEOPOR Osteoporosis 31
Print Format: F1
Write Format: F1

Value	Label
1	yes
2	no

FRACTURE Fracture 32
Print Format: F1
Write Format: F1

Value	Label
1	yes
2	no

MSTYPE Other Type of Muscular-Skeletal Diagnosis 33
Print Format: F2
Write Format: F2
Missing Values: 99

Value	Label
2	carpal tunnel syndrome
4	degenerative disc disease
5	degenerative hip disease
9	paraplegia
11	spinal stenosis
14	osteomylitis
99 M	none

CANCER Cancer 34
Print Format: F1
Write Format: F1

Value	Label
1	yes
2	no

URINARY Urinary System Disorder 35
Print Format: F1
Write Format: F1

Value	Label
1	yes
2	no

NEUROL Neurological Disorders 36
Print Format: F2
Write Format: F2

Value	Label
1	yes
2	no

CIOTHER Other Diagnosis 37
Print Format: F2
Write Format: F2
Missing Values: 99

Value	Label
1	angioedema
2	chronic anemia
3	chronic pain
4	cystoderma
5	decubitus ulcers
6	cataracts
7	lymphanedema
8	lymphocytic leukemia
10	hearing loss
11	peripheral edema
12	status dermatitis
13	substance abuse
14	obesity
16	blind
25	glaucoma
99 M	none

ADDDIAGN Additional Diagnosis 38
Print Format: F2
Write Format: F2
Missing Values: 99

Value	Label
3	cataracts
4	chronic anemia
11	substance abuse
99 M	no additional diagnosis

MORSEFAL Morse Fall Scale Score 39
Print Format: F3
Write Format: F3
Missing Values: 888

Value	Label
888 M	unknown

PHYSICAL Physical Disability 40
Print Format: F1
Write Format: F1

Value	Label
1	yes
2	no

BDZ0D Use of Benzodiazepines at Admission 41
Print Format: F1
Write Format: F1

Value	Label
1	yes
2	no

TYPEA0D First Type of Benzodiazepine Used at Admission 42
Print Format: F1
Write Format: F1

Value	Label
1	alprazolam
2	diazepam
3	flurazepam
4	lorazepam
5	oxazepam
6	temazepam
7	triazolam
8	other
9	not applicable

DOSEA0D Dose of Benzodiazepine A at Admission 43

Print Format: F2
Write Format: F2

Value	Label
1	0.125 mg
2	0.25 mg
3	0.125-0.25 mg
4	0.5 mg
5	1.0 mg
6	0.5-1.0 mg
7	5.0 mg
8	7.5 mg
9	10.0 mg
10	5-10 mg
11	15 mg
12	30 mg
13	15-30 mg
14	other
15	2 mg
99	not applicable

FREQA0D Frequency of Benzodiazepine A at Admission 44

Print Format: F2
Write Format: F2

Value	Label
1	QD
2	QD PRN
3	BID
4	BID PRN
5	TID
6	TID PRN
7	QID
8	Q6H PRN
9	QHS
10	QHS PRN
11	OTHER
12	Q4-6H
13	Q4H
99	NOT APPLICABLE

TYPEB0D Second Type of Benzodiazepine Used at Admission 45

Print Format: F1
Write Format: F1

Value	Label
1	alprazolam
2	diazepam
3	flurazepam
4	lorazepam
5	oxazepam
6	temazepam
7	triazolam
8	other
9	not applicable

DOSEB0D Dosage of Benzodiazepine B at Admission 46

Print Format: F2
Write Format: F2

Value	Label
1	0.125 mg
2	0.25 mg
3	0.125-0.25 mg
4	0.5 mg
5	1.0 mg
6	0.5-1.0 mg
7	5.0 mg
8	7.5 mg
9	10.0 mg
10	5-10 mg
11	15 mg
12	30 mg
13	15-30 mg
14	other
15	2 mg
99	not applicable

FREQB0D Frequency of Benzodiazepine B at Admission 47

Print Format: F2
Write Format: F2

Value	Label
1	QD
2	QD PRN
3	BID
4	BID PRN
5	TID
6	TID PRN
7	QID
8	Q6H PRN
9	QHS
10	QHS PRN
11	OTHER
12	Q4-6H
13	Q4H
99	NOT APPLICABLE

RBDZA0D Reason for Benzodiazepine A 48

Print Format: F1
Write Format: F1

Value	Label
1	anxiety
2	insomnia
3	muscle relaxation
4	seizure control
5	no indication for use
6	other
7	agitation
8	tension
9	not applicable

RBDZB0D Reason for Benzodiazepine B 49
Print Format: F1
Write Format: F1

Value	Label
1	anxiety
2	insomnia
3	muscle relaxation
4	seizure control
5	no indication for use
6	other
7	agitation
8	tension
9	not applicable

DBDZA0D Number of Doses Benzodiazepine A 0-30 Days 50
Print Format: F2
Write Format: F2
Missing Values: 88, 99

Value	Label
88 M	not available

DBDZB0D Number of Doses of Benzodiazepine B 0-30 Days 51
Print Format: F2
Write Format: F2
Missing Values: 99

BDZ30D Use of Benzodiazepines at 30 Days 52
Print Format: F1
Write Format: F1

Value	Label
1	yes
2	no

TYPEA30D First Type of Benzodiazepine Used at 30 Days 53
Print Format: F1
Write Format: F1

Value	Label
1	alprazolam
2	diazepam
3	flurazepam
4	lorazepam
5	oxazepam
6	temazepam
7	triazolam
8	other
9	not applicable

DOSEA30 Dose of Benzodiazepine A at 30 Days 54
Print Format: F2
Write Format: F2

Value	Label
1	0.125 mg
2	0.25 mg
3	0.125-0.25 mg
4	0.5 mg
5	1.0 mg
6	0.5-1.0 mg
7	5.0 mg
8	7.5 mg
9	10.0 mg
10	5-10 mg
11	15 mg
12	30 mg
13	15-30 mg
14	other
15	2 mg
99	not applicable

FREQA30D Frequency of Benzodiazepine A at 30 Days 55
Print Format: F2
Write Format: F2

Value	Label
1	QD
2	QD PRN
3	BID
4	BID PRN
5	TID
6	TID PRN
7	QID
8	Q6H PRN
9	QHS
10	QHS PRN
11	OTHER
12	Q4-6H
13	Q4H
99	NOT APPLICABLE

TYPEB30D Second Type of Benzodiazepine Used at 30 Days 56
Print Format: F1
Write Format: F1

Value	Label
1	alprazolam
2	diazepam
3	flurazepam
4	lorazepam
5	oxazepam
6	temazepam
7	triazolam
8	other
9	not applicable

DOSEB30D Dosage of Benzodiazepine B at 30 Days 57
Print Format: F2
Write Format: F2

Value	Label
1	0.125 mg
2	0.25 mg
3	0.125-0.25 mg
4	0.5 mg
5	1.0 mg
6	0.5-1.0 mg
7	5.0 mg
8	7.5 mg
9	10.0 mg
10	5-10 mg
11	15 mg
12	30 mg
13	15-30 mg
14	other
15	2 mg
99	not applicable

FREQB30D Frequency of Benzodiazepine B at 30 Days 58
Print Format: F2
Write Format: F2

Value	Label
1	QD
2	QD PRN
3	BID
4	BID PRN
5	TID
6	TID PRN
7	QID
8	Q6H PRN
9	QHS
10	QHS PRN
11	OTHER
12	Q4-6H
13	Q4H
99	NOT APPLICABLE

RBDZA30D Reason for Benzodiazepine A at 30 Days 59
Print Format: F1
Write Format: F1

Value	Label
1	anxiety
2	insomnia
3	muscle relaxation
4	seizure control
5	no indication for use
6	other
7	agitation
8	tension
9	not applicable

RBDZB30D Reason for Benzodiazepine B at 30 Days 60
Print Format: F1
Write Format: F1

Value	Label

Value	Label
1	anxiety
2	insomnia
3	muscle relaxation
4	seizure control
5	no indication for use
6	other
7	agitation
8	tension
9	not applicable

DBDZA30D Number of Doses of Benzodiazepine A 30-60 Days 61
Print Format: F2
Write Format: F2
Missing Values: 99

Value	Label
88	not available

DBDZB30D Number of Doses of Benzodiazepine B 30-60 Days 62
Print Format: F2
Write Format: F2
Missing Values: 99

BDZ60D Use of Benzodiazepines at 60 Days 63
Print Format: F1
Write Format: F1

Value	Label
1	yes
2	no

TYPEA60D First Type of Benzodiazepine Used at 60 Days 64
Print Format: F1
Write Format: F1

Value	Label
1	alprazolam
2	diazepam
3	flurazepam
4	lorazepam
5	oxazepam
6	temazepam
7	triazolam
8	other
9	not applicable

DOSEA60D Dose of Benzodiazepine A at 60 Days 65
Print Format: F2
Write Format: F2

Value	Label
1	0.125 mg
2	0.25 mg
3	0.125-0.25 mg
4	0.5 mg
5	1.0 mg
6	0.5-1.0 mg
7	5.0 mg
8	7.5 mg
9	10.0 mg
10	5-10 mg
11	15 mg
12	30 mg
13	15-30 mg
14	other
15	2 mg
99	not applicable

FREQA60D Frequency of Benzodiazepine A at 60 days 66
Print Format: F2
Write Format: F2

Value	Label
1	QD
2	QD PRN
3	BID
4	BID PRN
5	TID
6	TID PRN
7	QID
8	Q6H PRN
9	QHS
10	QHS PRN
11	OTHER
12	Q4-6H
13	Q4H
99	NOT APPLICABLE

TYPEB60D Second type of Benzodiazepine used at 60 days 67
Print Format: F1
Write Format: F1

Value	Label
1	alprazolam
2	diazepam
3	flurazepam
4	lorazepam
5	oxazepam
6	temazepam
7	triazolam
8	other
9	not applicable

DOSEB60D Dosage of Benzodiazepine B at 60 days 68
Print Format: F2
Write Format: F2

Value	Label
1	0.125 mg
2	0.25 mg
3	0.125-0.25 mg
4	0.5 mg
5	1.0 mg
6	0.5-1.0 mg
7	5.0 mg
8	7.5 mg
9	10.0 mg
10	5-10 mg
11	15 mg
12	30 mg
13	15-30 mg
14	other
15	2 mg
99	not applicable

FREQB60D Frequency of Benzodiazepine B at 60 days 69

Print Format: F2
Write Format: F2

Value	Label
1	QD
2	QD PRN
3	BID
4	BID PRN
5	TID
6	TID PRN
7	QID
8	Q6H PRN
9	QHS
10	QHS PRN
11	OTHER
12	Q4-6H
13	Q4H
99	NOT APPLICABLE

RBDZA60D Reason for Benzodiazepine A at 60 Days 70

Print Format: F1
Write Format: F1

Value	Label
1	anxiety
2	insomnia
3	muscle relaxation
4	seizure control
5	no indication for use
6	other
7	agitation
8	tension
9	not applicable

RBDZB60D Reason for Benzodiazepine B at 60 Days 71

Print Format: F1
Write Format: F1

Value	Label
1	anxiety
2	insomnia
3	muscle relaxation
4	seizure control
5	no indication for use
6	other
7	agitation
8	tension
9	not applicable